

1 RONALD K. ALBERTS (SBN 100017)  
2 TAD A. DEVLIN (SBN 190355)  
3 GORDON & REES LLP  
4 275 Battery Street, Suite 2000  
5 San Francisco, CA 94111  
6 Telephone: (415) 986-5900  
7 Facsimile: (415) 986-8054  
8 Attorneys for Defendants

9 UNITED STATES DISTRICT COURT  
10 NORTHERN DISTRICT OF CALIFORNIA

|                                |   |  |
|--------------------------------|---|--|
| 11 DAWN RUTHERFORD,            | ) | Case No. CV 07-6426 (WHA)                      |
|                                | ) |  |
| 12 Plaintiff,                  | ) | DECLARATION OF RONALD K. ALBERTS               |
|                                | ) | AND ATTESTATION OF CONFORMED                   |
| 13 v.                          | ) | SIGNATURES IN SUPPORT OF                       |
|                                | ) | DEFENDANT THE PRUDENTIAL                       |
| 14 SCENE 7, INC. LONG TERM     | ) | INSURANCE COMPANY OF AMERICA                   |
| 15 DISABILITY PLAN, PRUDENTIAL | ) | AND SCENE 7 INC. LONG TERM                     |
| INSURANCE COMPANY OF AMERICA,  | ) | DISABILITY PLAN'S MOTION FOR                   |
|                                | ) | SUMMARY JUDGMENT                               |
| 16 Defendants.                 | ) |  |
|                                | ) | Date: July 10, 2008                            |
|                                | ) | Time: 8:00 a.m.                                |
|                                | ) | Ctrm: 9  |
|                                | ) |  |
|                                | ) | [Filed and served concurrently with            |
|                                | ) | Memorandum of Points and Authorities;          |
|                                | ) | Declaration of Tamika Williams; Declaration of |
|                                | ) | Edith Ewing; [Proposed] Order, and [Proposed]  |
|                                | ) | Judgment]                                      |

22  
23 I, Ronald K. Alberts, declare as follows:

24 1. I am an attorney at law, duly admitted to practice law in the United States District  
25 Court for the Northern District of California and am a partner with the law firm of Gordon &  
26 Rees LLP, counsel of record for Defendants, THE PRUDENTIAL INSURANCE COMPANY  
27 OF AMERICA and SCENE 7 INC. LONG TERM DISABILITY PLAN ("Defendants"). I have  
28

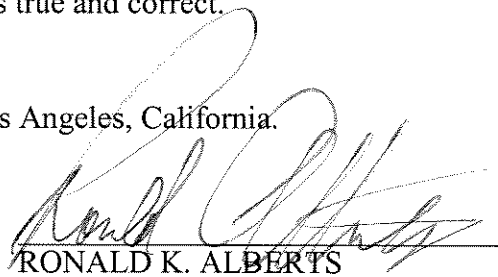
1 personal knowledge of the following facts, and if called upon to testify, I could and would  
2 competently testify to their truth and accuracy. I submit this declaration in support of  
3 Defendants' Motion for Summary Judgment.

4 2. Attached hereto as Exhibit "A" are true and correct copies of those pages from the  
5 Administrative Record, which is being lodged concurrently, referred to in Defendants' Motion  
6 for Summary Judgment.

7 3. I hereby attest that I have on file all holograph signatures for any signatures  
8 indicated by a "conformed" signature (/s/) within this e-filed document.

9 I declare under penalty of perjury pursuant under the laws of the State of California and  
10 the United States of America that the foregoing is true and correct.

11  
12 Executed this 5th day of June, 2008 at Los Angeles, California.

13  
14   
RONALD K. ALBERTS

# **EXHIBIT A**

**RICHARD JOHNSTON**  
Attorney at Law  
131-A Stony Circle, Suite 500  
Santa Rosa, California 95401  
(707) 577-7422  
Fax (707) 7837-9532  
e-mail: RichardJohnstonEsq@gmail.com

May 4, 2007

**Via fax only (866) 285-8569 and First Class Mail**

James E. Furman  
Appeals Analyst  
The Prudential Insurance Company of America  
Disability Management Services  
P.O. Box 13480  
Philadelphia, Pennsylvania 19101

**Re:** Claimant: Dawn A. Rutherford  
Control #/Br: 76787 / 00001  
Claim #: 10421380  
Social Security #: 156-62-5412  
Date of Birth: 02/18/1962

Dear Mr. Furman:

I am writing as you suggested in your correspondence dated November 3, 2006 (which was mailed on November 7, according to the postmark on the envelope, a copy of which accompanies this letter) to bring Ms. Rutherford's case to the attention of Prudential's Appeals Committee. I frankly do not have any expectation that Ms. Rutherford's case will be given any more of a fair review than it has in other departments within Prudential, but Ms. Rutherford does desire to exhaust all administrative remedies available to her before proceeding to court.

This letter will be brief, based on my expectation that you will make the entire file, including previous administrative appeal letters, available to the Appeals Committee. The points raised in those previous communications retain their validity and, in themselves, provide amply sufficient reason to reverse the termination of Ms. Rutherford's benefits.

Your correspondence dated November 3 focuses myopically on the conclusions of Dr. Kimelman, based on his examination of Ms. Rutherford, while ignoring the great weight of evidence in the file (including the opinions of Dr. Gerson, Prudential's own retained physician consultant). This cherry-picking of evidence is improper and grossly unfair to Ms. Rutherford.

Your correspondence dated November 3 also places great weight on "Waddell signs," at one point describing Ms. Rutherford's "highest level Waddell score" as corroborative of what you perceive as "her symptom magnification."

This use of Waddell signs is blatantly improper and betrays a troubling bias on Prudential's part. I have provided along with this letter some medical literature on point.

1. A 1998 article appearing in Spine Journal and co-authored by Gordon Waddell,

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DSc, M.D., the originator of the test for Waddell signs. This article is entitled *Behavioral Responses to Examination: a Reappraisal of the Interpretation of "Nonorganic Signs."* In this article, Dr. Waddell notes that Waddell signs "were shown not to be a feature of medicolegal presentation (as previously supposed), but also occur in patients seeking clinical treatment, particularly in patients with chronic pain and a history of failed treatment." That, of course, precisely describes Ms. Rutherford, and quite adequately accounts for Dr. Kimelman's observations on which Prudential bases its accusation of "symptom magnification." Other pertinent comments by Dr. Waddell include the following:

It sometimes is assumed that behavioral responses to examination necessarily are evidence of deliberate and conscious simulation on the part of the patient. Although it is possible to fake such responses, it cannot be assumed without further evidence that behavioral signs are *de facto* to be viewed with suspicion.

It is important to identify general nervousness about consultations and consider factors that may affect how the patient responds to assessment. Specific memories and expectations of painful examinations may produce inconsistencies in presentation as a result of fear. Specific fears of examination should be identified during the clinical interview before a physical examination is performed, because they may influence the patient's reaction to examination. Consideration of fear of pain, misunderstandings regarding hurting/harming, and beliefs regarding treatment outcome and future incapacity may assist in the interpretation of behavioral signs.<sup>1</sup>

Perhaps the most serious misuse and misinterpretation of behavioral signs has occurred in medicolegal contexts. The signs frequently are used as an indication of faking or simulated incapacity. It is certainly true that all sorts of behavior can be faked, and responses to examination are not exempt from this charge. As stated above, however, behavioral signs may be learned responses to pain that have developed since the original injury and of which the patient is largely unaware. Even if the behavioral signs are assumed to be under voluntary control, however, and if the patient is consciously responding in a guarded manner, it cannot be assumed *de facto* that the signs are evidence of simulation for the purpose of financial gain. In the first instance, the signs should be viewed as an indicator of pain behavior. Their interpretation should be considered with reference to other psychological and behavioral information. In the absence of distress, fear, mistaken beliefs, maladaptive coping strategies, and active attempts to seek treatment, it is perhaps more likely that the signs are evidence of simulation, but the behavioral signs cannot be interpreted in isolation.

2. An article published in 2003 in *Pain Medicine*, the publication of the American

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<sup>1</sup>This passage from Dr. Waddell's article is particularly apt. Ms. Rutherford was certainly fearful and did not trust Dr. Kimelman not to cause her pain and discomfort, as a function of previous examinations and similar experiences. As Dr. Waddell contemplates in his article, these factors are much more prevalent in terms of explaining the behavioral aspects Dr. Kimelman observed, and Prudential has no basis to conclude Ms. Rutherford was malingering or otherwise "magnifying her symptoms."

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Academy of Pain Medicine, by Fishbain et al. This article is entitled *A Structured Evidence-Based Review on the Meaning of Nonorganic Physical Signs: Waddell Signs*. This comprehensive review of medical literature, among other things, concludes that Waddell Signs "are not associated with secondary gain."

3. An article in the December 2004 edition of the clinical Journal of Pain, again by Fishbain et al., entitled *Is There a Relationship Between Nonorganic Physical Findings (Waddell Signs) and Secondary Gain/Malingering?* This study was conducted specifically to evaluate "the concept of nonorganic findings (Waddell signs) and their potential relationship to secondary gain and malingering." Again, after a comprehensive analysis, the authors concluded as follows:

This structured evidence-based review of the association of [Waddell signs] and secondary gain and malingering has led to the following major conclusion. Although inconsistent, the research evidence indicates that there is little evidence for an association between [Waddell signs] and secondary gain and, thereby, malingering. The preponderance of the evidence points to the opposite conclusion: no association.

The foregoing summary touches on the major pertinent conclusions of these various studies; they are enclosed so that Prudential can review them in their entirety so as to conduct an adequate analysis. Such an analysis could yield only one conclusion, and that is that the observations of Dr. Kimelman when he examined Ms. Rutherford, including "Waddell signs," do not indicate that Ms. Rutherford was magnifying her symptoms or otherwise malingering during the examination. Rather, she has suffered for many years from chronic pain, and serial attempted treatments have failed. As the studies indicate, this well accounts for Dr. Kimelman's observations, and far from suggesting that Ms. Rutherford is malingering, it indicates rather that Dr. Kimelman's observations are themselves a function of her profound disability.

Prudential has one last chance to reverse its erroneous termination of Ms. Rutherford's benefits and bring this matter to a proper and just conclusion. Should Prudential fail to do so, my advice to Ms. Rutherford will certainly include serious consideration of initiating judicial proceedings in order to rectify Prudential's wrongdoing.

Very truly yours,

  
Richard Johnston

RJ/jj  
enc.

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## Behavioral Responses to Examination: A Reappraisal of the Interpretation of "Nonorganic Signs"

Main, Chris J. PhD; Waddell, Gordon DSc, MD

From the Department of behavioral Medicine, Hope Hospital, Manchester, England.

Acknowledgment date: September 30, 1997.

First revision date: January 1, 1998.

Acceptance date: February 13, 1998.

Address reprint requests to: Chris J. Main, PhD; Hope Hospital; Eccles Old Road; Salford, Manchester M6 8HD; England, United Kingdom.

**Abstract**

Waddell et al in 1980 developed a standardized assessment of behavioral responses to examination. The signs were associated with other clinical measures of illness behavior and distress, and are not simply a feature of medicolegal presentations. Despite clear caveats about the interpretation of the signs, they have been misinterpreted and misused both clinically and medicolegally. Behavioral responses to examination provide useful clinical information, but need to be interpreted with care and understanding. Isolated signs should not be overinterpreted. Multiple signs suggest that the patient does not have a straightforward physical problem, but that psychological factors also need to be considered. Some patients may require both physical management of their physical pathology and more careful management of the psychosocial and behavioral aspects of their illness. Behavioral signs should be understood as responses affected by fear in the context of recovery from injury and the development of chronic incapacity. They offer only a psychological "yellow-flag" and not a complete psychological assessment. Behavioral signs are not on their own a test of credibility or faking.

Clinical assessment usually begins with a clinical history and continues with a physical examination. In the assessment of back pain, the patient's response to examination is particularly important. Waddell et al<sup>19</sup> drew attention to nonorganic signs in back pain in 1980 and attempted to integrate them into modern concepts of pain and illness behavior. In the past two decades, they have

**Article Outline**

- Abstract
- Behavioral Responses to Examination
- Further Research Findings
- A Reconsideration Based on Current Knowledge
  - Clinical History and Chronic Incapacity
  - The Nature of Pain Behavior
  - Relation to Other Psychological Factors
  - Relation to Fear and Guarded Movements
- Theoretical Misunderstandings in Current Orthoped...
  - Conscious Versus Unconscious Origins of Pain Behavior
  - Failure to Understand Fear-Mediated Responses
  - Nature of Recovery From Injury and the Development of Chron...
  - Coexistence With Physical Signs
  - Objectivity, Judgment, and Bias
- Misuses and Misinterpretations in Clinical Context...
  - Failure to Adhere to the Recommended Cut-Offs

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become widely used and appeared under a variety of names such as Waddell signs, inappropriate signs, medically incongruent signs, and behavioral signs. The signs will be referred to as behavioral signs in this article.

Despite clear caveats about the interpretation of the signs,<sup>22</sup> they have been misinterpreted and misused both in clinical contexts and in medicolegal assessment. The purpose of this article is to offer a reconsideration of their use and interpretation.

## Behavioral Responses to Examination

TOP

Since the turn of the century, responses to examination that were considered excessive or not entirely consistent with the physical findings were taken quite simply as evidence of malingering. Initially such assessments were carried out for evaluation of compensation. Although in later years behavioral signs came to form part of clinical assessment, the assessments were impressionistic and unstandardized.

(Overinterpre...

- o Mistaking the Signs Test for a Full Psychological Assessment
- o Justification of Refusal to Offer Adequate/Appropriate Phys...
- o Inappropriate Differential Diagnoses
- Misuses and Misinterpretations in Medicolegal Con...
- o Failure to Recover From Injury
- o Interpreting Signs as Indicators of Faking
- Conclusions and Recommendations
- Acknowledgments
- References
- Citing Articles

### Figures/Tables

- Table 1

Waddell et al<sup>19</sup> developed a standardized assessment of behavioral responses to examination. They initially examined 26 clinical signs commonly used in clinical practice, but a large number of these signs proved to be unrepeatable, unstable, or so rare as to be unuseable. A number of statistical and clinical criteria were used to decide on the final set of signs. Each of the signs had to be individually satisfactory, but, in addition, the final set had to form an integrated assessment. The eight original signs are shown in Table 1, together with the elements of the Behavioral Observation Test,<sup>2</sup> which can be thought of as a further refinement of "overreaction to examination." Efforts are still being made to identify new signs. Many patients with back pain display one or two such signs, and isolated findings must not be overinterpreted.

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## Behavioral Signs

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Superficial tenderness

Nonanatomic tenderness

Axial loading

Simulated rotation

Distraction straight leg raising

Regional weakness

Regional sensory change

"Overreaction" to examination = Overt pain behavior (grimacing, sighing, guarding, bracing, rubbing)

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Table 1. Behavioral Signs

The behavioral signs were shown to be reliable, were correlated with each other, and were distinguishable



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from other aspects of physical examination. Detailed descriptions are given in the source references.<sup>10</sup>

The signs were found to be associated with other clinical measures of illness behavior and with distress. They therefore were shown not to be simply a feature of medicolegal presentation (as previously supposed), but also to occur in patients seeking clinical treatment, particularly in patients with chronic pain and a history of failed treatment.

The behavioral signs were considered to clarify clinical assessment by:

1. enabling the separate assessment of physical and nonorganic elements of clinical presentation and therefore clarified clinical decision-making;
2. directing physical treatment specifically toward physical pathology;
3. preventing the administration of inappropriate treatment; and
4. assisting in the identification of illness behavior;

In summary, the presence of several signs was taken as indicating that the patient does not have a straightforward physical problem. Three specific caveats however were contained in the original article:

1. An increase in signs was associated with older patients and the test was not recommended for use with elderly patients.
2. It was emphasized, however, that behavioral signs can and do occur with clear organic findings. The presence of signs, therefore, does not contradict organic findings.
3. It was stressed that isolated behavioral signs should not be considered clinically significant. A cut-off at three or more was suggested.

Finally, the relation between physical and psychological factors in the original article<sup>10</sup> was summarized as follows:

It is safer to assume that all patients complaining of back pain have a physical source of pain in their back. Equally, all patients with pain show some emotional and behavioral reaction. Physical pathology and nonorganic reactions are discrete but frequently interacting dimensions; they are not alternative diagnoses but should each be assessed separately.

### Further Research Findings <sup>TOP</sup>

Since the behavioral signs were originally published, their nature has been investigated further.

The reliability of the individual signs originally was based on three independent studies of inter-rater reliability. It is surprising, therefore, that McCombe et al<sup>14</sup> did not confirm the high inter-rater reliability of the individual signs, but this may have been a result of the very low incidence of the signs in their clinical sample. Only the presence of several signs merits clinical interpretation, and, as Scalzitti<sup>17</sup> has pointed out, McCombe et al<sup>14</sup> did not examine the reliability of assignment according to the recommended cut-offs. In their study, Reesor and Craig<sup>16</sup> found the total score to be highly reliable.

The clinical validity of the signs has been assessed independently, and similar associations between behavioral signs, levels of disability, clinical history variables, and psychological variables have been found.<sup>16</sup>

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The value of the signs as psychological screeners also has been confirmed,<sup>4</sup> but it has also been shown that the signs may be less sensitive than psychometric measures of distress,<sup>13</sup> possibly because of the relatively low incidence of behavioral signs in general orthopaedic clinics.

Hayes et al<sup>5</sup> found a higher incidence of behavioral signs in patients receiving compensation than in those not receiving compensation. Those authors used this finding to conclude that the signs were essentially "nomogenic" in character, i.e., to be interpreted as evidence of simulated incapacity for the purpose of financial gain. Unfortunately Hayes et al did not take into account other clear differences between the two groups in question, and their conclusions cannot be regarded as valid.

Finally, patients exhibiting significant numbers of behavioral signs have been shown to have poorer outcome of treatment<sup>3,7,11,20</sup> and a poorer rate of return to work.<sup>10,15,17</sup> However, Brandish et al<sup>1</sup> found no correlation with return to work,<sup>1</sup> so the precise relation of the behavioral signs with return to work has not been established definitively as yet.

## **A Reconsideration Based on Current Knowledge <sup>TOP</sup>**

### **Clinical History and Chronic Incapacity <sup>TOP</sup>**

When the signs were standardized, their relation to psychological factors was not fully understood. It was recognized, however, that these behavioral responses contributed to the explanation of disability and were, in turn, associated with failed previous treatment. Behavioral signs essentially were considered to be a feature only of chronic incapacity. Recent studies have suggested that, although rarer, signs can be identified much earlier in the course of treatment.<sup>2,9</sup> They therefore may be implicated in the development of chronicity and may be more than simply an aspect, effect, or result of chronicity.

### **The Nature of Pain Behavior <sup>TOP</sup>**

The specific concept and the assessment of overt pain behaviors<sup>18</sup> were developed concurrently with the behavioral signs and provide more accurate assessment of "overreaction to examination" (one of the behavioral signs). It has become clear that the behavioral signs should be understood as part of a wider set of pain behavior assessment tools, such as pain drawings, reporting of behavioral symptoms,<sup>22</sup> need for walking aids, and need for extended down-time.<sup>18</sup>

### **Relation to Other Psychological Factors <sup>TOP</sup>**

Originally, the behavioral signs were demonstrated to be related to psychological distress, but the nature of the relationship was not clearly understood. Since the second half of the 1980s, however, there has been a considerable development in the assessment and understanding of more specific psychological features, such as beliefs and coping strategies<sup>8</sup> and specific fears of hurting and harming.<sup>21</sup> The relation between such parameters and behavioral signs would seem to merit further investigation.

### **Relation to Fear and Guarded Movements <sup>TOP</sup>**

Recent studies using surface electromyography from the paraspinal muscles have found patterns of response that distinguish patients with back pain from healthy controls, at rest and during standardized movement.<sup>24,25</sup> The sEMG abnormality in the patients with back pain improved significantly after they participated in a pain management program. The best predictor of normalization proved to be reduction in fear-avoidance beliefs and increased confidence in managing pain. The study demonstrated a clear association between fear, lack of self-confidence, and guarded movements. In another study of patients with chronic low back pain who participated in a pain management program,<sup>23</sup> a high correlation was demonstrated between behavioral signs and performance on specific functional tasks. These studies suggest that the behavioral signs are perhaps best understood as responses affected by fear.

## **Theoretical Misunderstandings in Current Orthopedic and Physiotherapeutic Practice <sup>TOP</sup>**

There are a number of ways in which the behavioral signs have been misunderstood and misused in

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practice. A number of theoretical misunderstandings may underlie this misuse.

### **Conscious Versus Unconscious Origins of Pain Behavior** <sup>TOP</sup>

It sometimes is assumed that behavioral responses to examination necessarily are evidence of deliberate and conscious simulation on the part of the patient. Although it is possible to fake such responses, it cannot be assumed without further evidence that behavioral signs are *de facto* to be viewed with suspicion.

### **Failure to Understand Fear-Mediated Responses** <sup>TOP</sup>

The reactive nature of assessment is not always appreciated. Patients arrive for a consultation with individual expectations and beliefs. Specific fears of pain or further injury can have a powerful influence on how a patient responds to physical examination. If patients have become fearful of pain, they may be nervous about being examined and show fear responses in the form of behavioral signs during physical examination.

### **Nature of Recovery From Injury and the Development of Chronic Incapacity** <sup>TOP</sup>

Not all patients make a complete recovery from injury (whether or not litigation is involved). Even if structural damage has not been clearly identified, soft tissue injury may have led to the development of chronic incapacity through a variety of mechanisms, such as reflex spasm and specific fears of hurting, harming, or reinjury. If pain has persisted, it may have led to the development of a disuse syndrome characterized by avoidance of painful movements or activities. It is necessary to appreciate the context of assessment and stage in the patient's history. The behavioral signs, therefore, can be identified and described as they occur during a clinical examination, but can only be understood fully as an aspect of the patient's clinical history. Their interpretation should be clarified further by identification of other clinical and psychological features that may coexist at time of physical examination.

It is important to identify general nervousness about consultations and consider factors that may affect how the patient responds to assessment. Specific memories and expectations of painful examinations may produce inconsistencies in presentation as a result of fear. Specific fears of examination should be identified during the clinical interview before a physical examination is performed, because they may influence the patient's reaction to examination. Consideration of fear of pain, misunderstandings regarding hurting/harming, and beliefs regarding treatment outcome and future incapacity may assist in the interpretation of behavioral signs.

### **Coexistence With Physical Signs** <sup>TOP</sup>

The behavioral signs test was designed specifically to identify behavioral responses in patients with low back pain. In that particular clinical group, the signs could be separated from physical signs not associated with distress. It should be recognized, however, that patients with low back pain may have other problems. Neck pain or fibromyalgia, for example, may need to be considered as alternative explanations for behaviors elicited in the context of an assessment of low back pain.

### **Objectivity, Judgment, and Bias** <sup>TOP</sup>

The behavioral signs test was developed as an objective assessment that could be carried out consistently by different examiners. Inevitably, however, a degree of judgment is required. Differences in the number of signs found by different examiners may not necessarily indicate real clinical differences among the groups of patients. Consistent differences among assessors in the number of behavioral signs found may illustrate inconsistencies in the manner in which the signs are elicited, unwitting bias, or even prejudice.

### **Misuses and Misinterpretations in Clinical Contexts** <sup>TOP</sup>

#### **Failure to Adhere to the Recommended Cut-Offs (Overinterpretation of Isolated Signs)** <sup>TOP</sup>

Overinterpretation of individual signs is common. The original article clearly stated that the test is designed to identify a pattern of responses to physical examination.

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### **Mistaking the Signs Test for a Full Psychological Assessment** TOP

Assessment of behavioral signs is not a complete psychological assessment. It is no more than a screening test. Significantly distressed and disabled patients require a specific psychological assessment.

### **Justification of Refusal to Offer Adequate/Appropriate Physical Treatment** TOP

Clear evidence of behavioral responses to examination indicate that the patient does not have a straightforward physical problem. He or she still may require an orthopedic intervention. In such cases, pain management as well as surgery may be necessary.

### **Inappropriate Differential Diagnoses** TOP

Evidence of a clear behavioral component in the individual's presentation does not mean that there is no need to investigate the rest of a patient's physical signs and symptoms. Significant physical impairment may produce high levels of distress.

### **Misuses and Misinterpretations in Medicolegal Contexts** TOP

#### **Failure to Recover From Injury** TOP

Failure to recover from injury should not necessarily be viewed with suspicion. An important and significant minority of patients become chronically incapacitated after injury, regardless of whether litigation is involved.

#### **Interpreting Signs as Indicators of Faking** TOP

Perhaps the most serious misuse and misinterpretation of behavioral signs has occurred in medicolegal contexts. The signs frequently are used as an indication of faking or simulated incapacity. It is certainly true that all sorts of behavior can be faked, and responses to examination are not exempt from this charge. As stated above, however, behavioral signs may be learned responses to pain that have developed since the original injury and of which the patient is largely unaware. Even if the behavioral signs are assumed to be under voluntary control, however, and if the patient is consciously responding in a guarded manner, it cannot be assumed *de facto* that the signs are evidence of simulation for the purpose of financial gain. In the first instance, the signs should be viewed as an indicator of pain behavior. Their interpretation should be considered with reference to other psychological and behavioral information. In the absence of distress, fear, mistaken beliefs, maladaptive coping strategies, and active attempts to seek treatment, it is perhaps more likely that the signs are evidence of simulation, but the behavioral signs cannot be interpreted in isolation.

Behavioral signs are suggestive of a "nonorganic" component in the patient's overall presentation. They do not represent a comprehensive psychological evaluation, and formulations such as "functional overlay" should not be taken as definitive. Assessment of psychological impact of pain requires consideration of distress, fears, beliefs about pain, and coping strategies.<sup>12</sup>

### **Conclusions and Recommendations** TOP

1. The term "pain behavior" can be used to describe a number of aspects of the patient's response to pain, but "behavioral signs" should be used only to describe specifically how the patient responds to examination.
2. The signs are therefore most accurately described as "behavioral responses to examination" and should be understood as such.
3. The behavioral signs offer an assessment of pain behavior in response to a standardized assessment.
4. They are a form of communication between patient and doctor and therefore are influenced by expectations (both by the patient and the doctor).
5. They must be understood in the context of the patient's history.



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6. They offer only a psychological "screener," not a complete psychological assessment.

7. They are not a reason to deny appropriate physical treatment. Some patients may require both physical management of their physical pathology and more careful management of the psychosocial and behavioral aspects of their illness. The signs should be used to decide not whether to offer treatment, but the type of treatment to offer.

8. The behavioral signs are not on their own a test of credibility or veracity. Interpretation of the signs is only possible within the context of a broader clinical or psychosocial assessment.

## Acknowledgments TOP

The authors thank Donal Fortune and Paul Watson.

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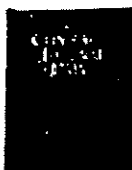
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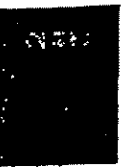
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## A Structured Evidence-Based Review on the Meaning of Nonorganic Physical Signs: Waddell Signs

David A. Fishbain, MD, FAPA,<sup>1,†</sup> Brandly Cole, PsyD,<sup>2,†</sup> R.B. Cutler, PhD,<sup>3,4,†</sup> John Lewis, PhD,<sup>5</sup> H.L. Rosomoff, MD, DMedSc, FAAPM,<sup>6,†</sup> and R. Steele Rosomoff, BSN, MBA<sup>6,†</sup>

Departments of <sup>1</sup>Psychiatry, <sup>2</sup>Neurological Surgery, and <sup>3</sup>Anesthesiology, <sup>4</sup>University of Miami School of Medicine, Miami, Florida. <sup>5</sup>University of Miami Comprehensive Pain & Rehabilitation Center at <sup>6</sup>South Shore Hospital, Miami, Florida

### ABSTRACT

**Study Design.** This is a structured, evidence-based review of all available studies addressing the concept of nonorganic findings: Waddell signs (WSs).

**Objectives.** To determine what evidence, if any, exists for the various interpretations for the presence of WSs on physical examination.

**Summary of Background Data.** WSs are a group of eight physical findings divided into five categories, the presence of which has been alleged at times to have the following interpretations: Malingering/secondary gain, hysteria, psychological distress, magnified presentation, abnormal illness behavior, abnormal pain behavior, and somatic amplification. At the present time, there is, therefore, significant confusion as to what these findings mean.

**Methods.** A computer and manual literature search produced 61 studies and case series reports relating to WSs. These references were reviewed in detail, sorted, and placed into tabular form according to the following subject areas: 1) Reliability (test-retest); 2) Reliability (inter-rater); 3) Reliability (factor analysis); 4) Validity, psychological distress; 5) Validity, correlation Minnesota Multiphasic Pain Inventory (MMPI); 6) Validity, correlation abnormal illness behavior; 7) Validity, other behaviors; 8) Validity, as a nonorganic phenomenon; 9) Validity, correlation pain drawing; 10) Validity, functional performance; 11) Validity, treatment outcome; 12) Validity, predicting surgical treatment outcome; 13) Validity, return to work outcome; 14) Validity, secondary gain correlation; and 15) Validity, pain correlation. Each study in each topic area was classified according to the type of study it represented according to the type of evidence guidelines developed by the Agency for Health Care Policy and Research (AHCPR). In addition, a list of 14 study quality criteria was used to measure the quality of each study. Each study was categorized for each criterion as positive, (criterion filled), negative (criterion not filled), or not applicable independently by two of the authors. A percent quality score was obtained for each study by counting the total number of positives obtained, dividing by 14 minus the total number of not applicables, and multiplying by 100. Only studies having a quality score of 75% or greater were used to formulate the conclusions of this review. The strength and consistency of the evidence represented by the remaining studies in each topic area (above) was then categorized according to the strength and consistency AHCPR guidelines. Conclusions of this review for each topic area are based on these results.

**Results of the Data Synthesis.** Of the 61 studies, four had quality scores below 75% and were not used to generate the results of this review. According to the AHCPR guidelines for strength and consistency of the reviewed data, the following results were obtained: 1) There was consistent evidence for WSs being associated with decreased functional performance, poor nonsurgical treatment outcome, and greater levels of pain; 2) There was generally consistent evidence for WSs not being associated with psychological distress, abnormal illness behavior, or secondary gain; 3) There was also generally consistent evidence that WSs are an organic phenomenon and that they cannot be used to discriminate organic from nonorganic problems; 4) There was inconsistent evidence that

Reprints requests to: David A. Fishbain, MD, FAPA, 600 Alton Road, Miami Beach, FL 33139. Tel: (305) 532-7246; Fax: (305) 534-3974; E-mail: d.fishbain@miami.edu.

WSs do demonstrate inter-rater reliability, do not correlate with the neurotic triad of the MMPI, are associated with poorer surgical treatment outcome, and are associated with nonreturn to work; 5) There was little or no evidence that WSs demonstrate test-retest reliability, or reliable factors, and are associated with self-esteem problems, catastrophizing, or the nonorganic pain drawing.

**Conclusions.** Based on the above results, the following conclusions were made: 1) WSs do not correlate with psychological distress; 2) WSs do not discriminate organic from nonorganic problems; 3) WSs may represent an organic phenomenon; 4) WSs are associated with poorer treatment outcome; 5) WSs are associated with greater pain levels; 6) WSs are not associated with secondary gain, and 7) As a group, WS studies demonstrate some methodological problems.

**Key Words:** Nonorganic Physical Signs; Waddell Signs; Nondermatomal Sensory Abnormalities; Abnormal Illness Behavior; Disease Magnification; Somatic Amplification; Conversion Symptoms; Malingering; Chronic Pain

### Introduction

During the 1980s, Waddell et al. [1-3] studied a group of low back pain (LBP) physical signs frequently found in chronic pain patients (CPPs). These signs, earlier in this century, were identified as predominantly nonorganic and, as such, were thought to represent either malingering or hysteria [4]. Waddell et al. [1] standardized these signs in CPPs and placed them into five general categories (tenderness, simulation, distraction, regional, and overreaction). In all, they listed eight signs under these five general categories (Table 1). Waddell et al. [1] also determined that these signs were reliable and valid and suggested that if a CPP demonstrated three or more categories of nonorganic signs that the CPP should be evaluated for psychological problems.

Table 1 Waddell's nonorganic signs

|  |
|--|
| <b>Tenderness</b>  |
| • Superficial skin tender to light touch   |
| • Nonanatomic deep tenderness not localized to one area  |
| <b>Simulation</b>  |
| • Axial loading pressure on the skull of a standing patient induces lower back pain                              |
| • Rotation: Shoulders and pelvis rotated in the same plane induces pain  |
| <b>Distraction</b>   |
| • Difference in straight leg raising in supine and sitting positions   |
| <b>Regional</b>  |
| • Weakness: Many muscle groups, "give-away weakness" (patient does not give full effort on minor muscle testing) |
| • Sensory: Sensory loss in a stocking or glove distribution, nondermatomal                                       |
| <b>Overreaction</b>  |
| • Disproportionate facial or verbal expression (i.e., pain behavior)   |

The interpretation of these nonorganic signs, henceforth called Waddell's signs (WSs), and their exact meaning has been fraught with difficulty. The presence of WSs has been thought to indicate psychological distress [3,5] and a more "magnified or more emphatic presentation of the severity of their problem" [3]. It was also proposed that WSs should draw attention to the possibility of abnormal illness behaviors [3], which was defined by Waddell [6] as "maladaptive overt illness related behavior which is out of proportion to the underlying physical disease and more readily attributable to associated cognitive and affective disturbance." WSs have also been equated with pain behavior and have been presented as a pain behavior assessment tool [6]. Finally, some other researchers have also equated WSs with "somatic amplification" [7]. Unfortunately, some of the above words, such as "magnified" and/or "out of proportion," have led some authors and clinicians [8,9] to revert to the original interpretation of WSs: Malingering or pain of psychological origin. For example, in a recent review [10] of detecting sincerity of effort, WSs are listed as one of the "widely" used methods to determine sincerity of effort. This led Main and Waddell [11] to attempt to "reappraise" the interpretation of WSs.

Since the early 1980s, WSs have been extensively used by clinicians [11]. As such, there is a wide body of literature on the subject. Unfortunately, although there has been one review [12] in this area, this literature has not been reviewed in detail in an evidence-based, structured fashion in order to clarify the interpretation of WSs. The

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**Table 2** Levels of evidence guidelines as applied by the AHCPR [13]

- |  |   |
|--|---|
| <b>A Types of evidence guidelines</b>                    |   |
| I  | A meta-analysis of multiple, well-designed, controlled studies  |
| II   | At least one well-designed experimental study   |
| III  | Well-designed quasiexperimental studies, such as nonrandomized controlled, single-group prepost, cohorts, time series, or matched case-controlled studies |
| IV   | Well-designed nonexperimental studies, e.g., comparative, correlational, descriptive, case control  |
| V  | Case reports and clinical examples  |
| <b>B Strength and consistency of evidence guidelines</b> |   |
| A  | There is evidence of Type I or consistent findings from multiple studies of Type II, III, or IV   |
| B  | There is evidence of Type II, III, or IV and findings are generally consistent  |
| C  | There is evidence of Type II, III, or IV but findings are inconsistent  |
| D  | There is little or no evidence or there is Type V evidence only   |

Panel consensus only: Practice recommended on the basis of opinion of experts in pain management.

purpose of this evidence-based, structured review is: 1) To isolate any studies that have addressed WSSs in pain patients; 2) To determine what evidence exists for the various interpretations on the meaning of WSSs; 3) To evaluate the quality of that evidence; and 4) Using high-quality studies only, to evaluate the strength of that evidence through an evidence-based, structured review process using the Agency for Health Care Policy and Research (AHCPR) levels of evidence guidelines (Table 2) [13]. It is to be noted that this review should not be confused with a meta-analysis.

**Methods**

Relevant references were located by the following procedure. MEDLINE, Psychological Abstracts, Science Citation Index, and the National Library of Medicine Physician Data Query (PDQ) databases were searched using the following 13 subject headings: Nonorganic physical signs; Waddell signs; nondermatomal sensory abnormalities; sensory loss stocking; sensory loss glove; physical findings; distraction; nonanatomic tenderness; illness behavior; conversion symptoms; disease magnification; abnormal illness behavior; pain behavior; and somatic amplification. Each of these was exploded with the medical subject heading (MESH) "pain." Each term was exploded for subheadings in MESH, and all retrieved references were reviewed. The searches were not restricted to the English language and were conducted back to 1966, except for

Science Citation Index, which was conducted back to 1974. The latest date searched for each database was 2000. A manual search was also performed using key pain journals, pain meeting abstracts, and textbooks. For the following journals, the following years were reviewed: *Pain*, 1975–2000; *Spine*, 1976–2000; *Journal of Pain and Symptom Management*, 1986–2000; *The Pain Clinic*, 1986–2000; and *Clinical Journal of Pain*, 1985–2000. Abstract books of the following meetings were reviewed for the following years: International Association for the Study of Pain, 1981, 1984, 1987, 1990, 1993, 1996, and 1999; and American Pain Society Meetings, 1982–2000. Three pain textbooks were reviewed for possible references. These were: *Evaluation and Treatment of Chronic Pain*, Third Edition, Aronoff G. editor, 1999; *Handbook of Pain Management*, Second Edition, Tollison CD, Satterthwaite JR, Tollison JW, editors, 1994; and *Textbook of Pain*, Third Edition, Wall P, Melzak R, editors, 1993. Ninety-eight references were found in this manner and were subject to a cursory review. Studies were chosen for detailed review according to one inclusion criterion only: If they addressed WSSs in some fashion. Of the 98 references found, 37 either did not relate to the subject area (WSSs) or used other concepts, such as nonorganic symptoms or related to disability issues. The 61 remaining studies [1,3,5,7,14–71] were sorted into groups according to which subject matter that study addressed in reference to the meaning of WSSs. It is to be noted that some studies addressed more than one subject matter relevant to this review. These groups were the following: 1) Reliability (test-retest) [1,18]; 2) Reliability (inter-rater) [1,7,18–20]; 3) Reliability (factor analysis) [22]; 4) Validity, the psychological distress concept [7,22–29]; 5) Validity, correlation with Minnesota Multiphasic Personality Inventory (MMPI) [1,21,22,30,31,55]; 6) Validity, correlation abnormal illness behavior [3,7,23,29]; 7) Validity, correlation other behavior [25,32,33]; 8) Validity, as a nonorganic phenomenon [25,35–44]; 9) Validity, correlation with pain drawing [46]; 10) Validity, functional performance [27,32,33,45,47–49]; 11) Validity, treatment outcome [5,22,30,31,50]; 12) Validity, predicting surgical outcome [1,7,16,30,31,51]; 13) Validity, outcome return to work [1,14,16,30,31,52–59,68,71]; 14) Validity, secondary gain correlation [1,7,14,15,17,22,25,27,28,46,48,49,60–62]; 15) Validity, pain correlation [15,16,25,27,28,50,60,63–67,69,70].

Research information from the 61 references was then abstracted into tabular form. Appendices



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1-15 were organized according to the above groupings. These tables are arranged to present the reference, research question, study design, sample size, nonorganic findings outcome measure, statistical analysis, results, quality score, categorization of type of evidence the study represented (Table 2A), and reviewer comments.

The quality of the studies was categorized according to the systems developed by and reported by Hoogendoorn et al. [72] and de Vet et al. [73]. These researchers developed and tested a list of criteria to be used to assess methodological quality of prospective, historical cohort, and case control studies. For details of how these criteria were developed, the reader is referred to the original studies [72,73]. Thirteen criteria were selected from their list that were appropriate to the studies utilized (Appendix 17). Hoogendoorn et al. [72] described 23 criteria, of which many of the criteria were not appropriate to the topic of this review and, as such, were not included in the criteria list used in this study. In addition to the 13 selected criteria, one other criterion was added. This criterion was appropriate to the topic being studied. Waddell et al. [1], in their original study, determined that, for a patient to be categorized as being positive for WSs, he/she had to have a positive finding on three out of five WS groups. As such, this was added to the criteria list as a desirable criterion. This resulted in a total of 14 criteria. The full criteria list is presented in Appendices 17A-D.

For each included study, each criterion was rated as either present/fulfilled (+), not present/unfulfilled (-), or not applicable (NA). NA was used as follows. There were basically four types of studies analyzed for quality: Case control, cohort, correlational, and case series. Thus, some criteria in Table 2 pertained only to case control studies, while others only to cohort studies, etc. As such, NA was used if the criterion in question pertained to another type of study other than the one being reviewed. In addition, NA was used when that criterion did not pertain to the study in question, for example, no need to use WS Groups. NA was not used when information was not available or not described [74]. Under those circumstances, a negative was assigned [74]. A negative was also assigned if the item did not meet the preselected criteria [74]. Each study was rated independently for each criterion by the senior author (DF) and another author (BC). Both raters chose either a positive, negative, or NA categorization for each criterion for each study selected for detailed review. The assigned categorizations by DF and

BC for each selected study were then compared in a meeting. Any discrepancies in the categorizations were resolved by mutual agreement. This resulted in a final decision as to whether each criterion received a negative, positive, or NA categorization. Categorizations were then summarized and placed into tabular format, (Appendices 17A-D). A quality score was obtained by counting the number of positives obtained. This score was divided by 14 (the total number of criteria) minus the number of NAs and multiplied by 100, which gave the percentage quality score.

Studies scoring less than 50% historically have been rated as "low quality" [74]. These studies are usually not used to arrive at conclusions about a review topic. For the purposes of this review, however, we arbitrarily set the acceptable quality score at 75%. Studies scoring less than 75% were not used in arriving at a conclusion about the reviewed topic. These studies are marked with a Q in Appendices 1-15.

The senior author was the one who independently abstracted the data into Appendices 1-15. However, data abstraction was checked independently by BC. Any discrepancies were resolved by mutual agreement. In addition, BC checked the classifications of the reviewed studies, that is, whether the reviewed study was a cohort, case control, etc. Any discrepancies in this classification were also resolved by mutual agreement.

The categorization of the type of evidence the study represented was based on the guidelines developed by the AHCPR for categorizing the levels of evidence represented by reviewed studies (Table 2A) [13]. Studies were categorized I through V according to this scheme. In this categorization, I represents a meta-analysis of well-designed, controlled studies and V represents a case report or clinical example. This categorization was also independently arrived at by the senior author and BC. Any discrepancies were again resolved by mutual agreement in a meeting format.

The strength and consistency of the research evidence in each group of studies in each table (Appendices 1-15) were then categorized according to the AHCPR guidelines [13] developed for this purpose (Table 2B). These guidelines allow the researcher to categorize the reviewed evidence as being consistent, generally consistent, nonconsistent, or demonstrating little evidence for supporting the hypothesis under study. In using these categorization guidelines, only studies attaining a score of 75% or greater were used. Categoriza-

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tions according to these guidelines (Table 2B) were performed independently by the senior author and B.C. Any discrepancies were later resolved by mutual agreement.

In addition, all references were reviewed for the following demographic questions: 1) What percentages of chronic LBP patients demonstrated each of the individual WSs? 2) What percentages of chronic LBP patients demonstrated 0, 1, 2, 3, 4, or 5 categories of WSs? 3) What percentages of CPPs with WSs demonstrated each category of WSs? and 4) Is there a differential distribution of WSs between the sexes? For questions 1, 2, and 3, mean percentages were calculated if possible. These data are presented in Appendices 18-20. Finally, data from Appendices 1-15 were formatted into a summary table (Table 3). This last table was designed to summarize the overall findings of the structured review by listing the following: The research question under study in reference to WSs; categorization of the type of evidence plus the overall quality score of the evidence utilized; categorization of the strength and consistency of the evidence; and conclusions from the strength and consistency categorization.

**Results**

Of the 61 studies, three [18,59,60] had quality scores below 75% (Appendices 1-15). These three studies were not used to arrive at overall quality scores or to arrive at strength and consistency of evidence conclusions.

Two studies [1,18] addressed the issue of WS test-retest reliability (Appendix 1). Both studies in this group represented Type III evidence. However, one study [18] had a quality score below 75% and was therefore not used to draw conclusions. The other study [1] demonstrated test-retest reliability in 85% of patients. Based on these observations and according to AHCPR guidelines (Table 2B), the consistency of this evidence was rated D (there is little or no evidence).

Five studies [1,7,18-20] addressed the issue of WS inter-rater reliability (Appendix 2). One study [1] in this group represented Type III evidence, while the rest [7,18-20] represented Type IV evidence. One study had a quality score below 75% and was therefore not used. Two studies [1,19] supported inter-rater reliability for WSs, while two [7,20] did not. Based on this observation and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated C (inconsistent evidence).

One study [22] addressed the issue of reliability of WSs in reference to factor analysis (Appendix 3). It found that, of the eight WSs, only four could be grouped to form one reliable factor. This study represented Type III evidence. Because of a lack of other studies in this category, the consistency of this evidence was rated D (there is little or no evidence).

Nine studies [7,22-29] addressed the issue of WS correlation with psychological distress and whether this concept is valid (Appendix 4). Three studies [2,25,26] in this group represented Type III evidence, and the rest represented Type IV evidence. The majority of these studies (87.8%) supported the no-psychological-distress correlation. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated B (generally consistent).

Six studies [1,21,22,30-31,55] (one study [31] was used twice for a total of seven reports) addressed the issue of WS correlation with the neurotic triad of the MMPI and whether this concept is valid (Appendix 5). All studies in this group represented Type III evidence. Three [1,27,55] of the seven studies, or 42.8%, supported the notion that there is a correlation between WSs and the neurotic triad of the MMPI. The majority (57.2%) of the studies ([21,30,31], one study was used twice), however, supported the alternate hypothesis: No correlation. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated C (inconsistent).

Four studies [3,7,23,29] addressed the issue of WS correlation with abnormal illness behavior (AIB) and whether this concept is valid (Appendix 6). Three [7,23,29] studies in this group represented Type IV evidence and one [3] represented Type III. The hypothesis that WSs are related to AIB was not supported. All studies (100%) supported the alternate hypothesis: No correlation. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated B (generally consistent).

Three studies [25,32,33] addressed the issue of WS correlation with self-esteem [32,33] and catastrophizing [25] (Appendix 7). All studies in this group represented Type III evidence. Neither of the self-esteem studies supported the hypothesis that WSs are related to self-esteem. The one catastrophizing study indicated a relationship between WSs and catastrophizing. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated as



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Table 3 Strength and consistency of the evidence for the WS research questions addressed in Appendices 3-17

| Research questions   | Type of evidence categorization (according to number of studies in each category) and overall quality score  | Categorization of strength and consistency of the overall evidence | Conclusions from research review categorization   |
|--|--|--|---|
| 1. Do WSs demonstrate test-retest reliability?   | 1 study, Type III<br>QS = 100%   | D  | Not enough studies to draw conclusion   |
| 2. Do WSs demonstrate inter-rater reliability?   | 1 study, Type III<br>3 studies, Type IV<br>QS = 90%  | C  | Inconsistent evidence that WSs demonstrate inter-rater reliability  |
| 3. Do WSs demonstrate reliable factors?  | 1 study, Type III<br>QS = 76.9%  | D  | Not enough studies to draw conclusion   |
| 4. Are WSs correlated with psychological distress?   | 3 studies, Type III<br>6 studies, Type IV<br>QS = 91.3%  | B  | Generally consistent findings that WSs are not associated with psychological distress   |
| 5. Are WSs correlated with the neurotic triad of the MMPI?   | 6 studies, Type III<br>QS = 95%  | C  | Inconsistent findings that WSs are not associated with the MMPI neurotic triad  |
| 6. Are WSs associated with abnormal illness behavior?  | 1 study, Type III<br>3 studies, Type IV<br>QS = 100%   | B  | Generally consistent findings that WSs are not associated with abnormal illness behavior  |
| 7. Are WSs associated with: A) Self-esteem or B) Catastrophizing?                                  | 3 studies, Type III<br>QS = 83.6%  | D (self-esteem)<br>D (catastrophizing)                             | Not enough studies to draw conclusions for catastrophizing and self-esteem association with WSs                                 |
| 8. Are WSs a nonorganic phenomenon and can WSs discriminate organic from nonorganic pain problems? | For discrimination:<br>2 studies, Type III<br>1 study, Type IV<br>QS = 91.6%<br>For organic phenomenon:<br>1 study, Type III<br>1 study, Type IV<br>4 studies, Type V<br>1 study, Type III<br>QS = 92.3% | B (organic phenomenon)<br>B (discrimination)                       | Generally consistent findings that WSs represent an organic phenomenon and cannot discriminate organic from nonorganic problems |
| 9. Is there a correlation between WSs and a nonorganic pain drawing?                               | 1 study, Type III<br>QS = 92.3%  | D  | Not enough studies to draw conclusion   |
| 10. Are WSs associated with decreased functional performance?                                      | 1 study, Type IV<br>6 studies, Type III<br>QS = 85.7%  | A  | Consistent findings that WSs are associated with poorer physical performance  |
| 11. Are WSs associated with poorer treatment outcome?  | 4 studies, Type III<br>1 study, Type IV<br>QS = 90.5%  | A  | Consistent findings that WSs are associated with poorer treatment (nonsurgical) outcome   |
| 12. Are WSs associated with poorer surgical outcome?   | 4 studies, Type III<br>1 study, Type IV<br>QS = 93.3%  | C  | Inconsistent findings that WSs are associated with poorer treatment (surgical) outcome  |
| 13. Are WSs associated with nonreturn to work?   | 14 studies, Type III<br>1 study, Type IV<br>QS = 91.4%   | C  | Inconsistent findings that WSs are associated with poorer treatment (nonreturn to work) outcome                                 |
| 14. Are WSs associated with secondary gain?  | 13 studies, Type III<br>3 studies, Type IV<br>QS = 87.5%   | B  | Generally consistent findings that WSs are not associated with secondary gains  |
| 15. Are WSs associated with pain?  | 5 studies, Type III<br>1 study, Type V<br>6 studies, Type IV<br>QS = 89%   | A  | Consistent findings that WSs are associated with greater pain   |

Abbreviations: QS = average quality score of studies in this research area.

D for both self-esteem and catastrophizing (there is little or no evidence).

Ten studies [35-44] addressed the issue of whether WSs represent a nonorganic phenomenon and/or can be counted on to discriminate nonorganic from organic problems (Appendix 8). Four studies [25,35,39/40,42] addressed the issue

of discrimination. However, of these, one [42] had a quality score of less than 75% and was not used. Of the remaining studies, two [25,35] were Type III and one [39/40] was Type IV. All three of those studies were consistent in indicating that WSs do not discriminate organic from nonorganic problems. Based on these observations and using

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AHCPR guidelines (Table 2B), the consistency of the above evidence was rated B. Six reports [36-38,41,43,44] addressed the issue of whether WSs represent an organic rather than a nonorganic phenomenon. Four studies [36,37,43,44] in that group represented Type V evidence, while one [38] represented Type III and another [41] represented Type IV. All those studies were consistent in indicating that WSs *do* have an organic substrate. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated B (generally consistent) for both issues.

One study [46] addressed the issue of whether WSs correlate with a nonorganic pain drawing (Appendix 9). This study represented Type III evidence indicating that there was a correlation. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated D (there is little or no evidence).

Seven studies [27,32,33,45,47-49] addressed the issue of whether WSs are associated with decreased functional performance (Appendix 10). All these studies, except one [27], represented Type III evidence, while the lone study represented Type IV evidence. All these studies were consistent in indicating that WSs are associated with poorer physical performance. Based on these observations and using AHCPR guidelines (Appendix Table 2B), the consistency of this evidence was rated A (consistent).

Five studies [5,22,30,31,50] (two studies [30,31] were used twice for a total of seven reports) addressed the issue of whether WSs are associated with treatment outcome (Appendix 11). All studies, except one [5], represented Type III evidence. All of these studies, except one [22] (which was unequivocal), were consistent in indicating that WSs are associated with poorer treatment outcome. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated A (consistent).

Five studies [1,16,30,31,51] (one study was used twice for a total of six reports) addressed the issue of whether WSs are associated with poorer surgical outcome (Appendix 12). All these studies, except one [16], represented Type III evidence, while the lone study represented Type IV evidence. The studies were not consistent in indicating whether WSs are associated with poorer surgical outcome. Fifty percent of the studies [1,30,51] indicated that WSs are associated with worse surgical outcome. Based on these observations and using AHCPR guidelines (Table 2B), the

consistency of this evidence was rated C (inconsistent).

Fifteen studies [1,14,16,30,31,52-59,68,71] (three [30,31,56] were used twice for a total of 18 reports) addressed the issue of whether WSs are associated with nonreturn to work (Appendix 13). All these studies, except one [16], represented Type III evidence, while the lone study [16] represented Type IV evidence. The studies were not consistent in indicating whether WSs are associated with nonreturn to work. Twelve studies [1,16,30,31,53-56,59,68,71], or 66.6%, indicated that WSs are associated with nonreturn to work. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated C (inconsistent).

Sixteen studies [1,7,14-17,22,25,27,28,46,48,49,60-62] (four [1,7,25,60] were used twice and two [22,48] were used three times for a total of 24 reports) addressed the issue of whether WSs are associated with secondary gain (Appendix 14). All these studies represented Type III evidence, except for three [7,27,28], which represented type IV evidence. The majority of the studies [1,7,14,22,25,27,28,46,48,61], 75.0%, indicated that WSs are not associated with secondary gain. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated B (generally consistent).

Fourteen studies [15,16,25,27,28,50,60,63-67,69,70] (one [66] was used twice for a total of 15 reports) addressed the issue of whether WSs are associated with greater pain perception (Appendix 15). Five [15,25,50,60,63] studies represented Type III evidence, one study [70] represented Type V evidence, and seven studies [16,27,28,64,66,67,69] represented Type IV. These studies were extremely consistent. All reports indicated a relationship between pain and WSs, and twelve of the reports indicated a relationship between greater pain and WSs. Based on these observations and using AHCPR guidelines (Table 2B), the consistency of this evidence was rated A (consistent).

Appendices 17A-D present the raw study quality ratings for each study for the 14 quality criteria. In addition, these tables present the overall quality score for each study.

Appendices 18-20 present the compilation of the demographic material for WSs. In reference to WS sex distribution, three studies [22,25,63] reported a higher frequency in women, while three studies [1,2,46] reported no differences between men and women.

Table 3 summarizes the strength and consistency of the evidence for the WS research questions presented in the introduction. This table indicates the following. There is substantial consistent evidence (rating A) for the following research findings: 1) WSs are associated with decreased functional performance; 2) WSs are associated with poorer nonsurgical treatment outcome; and 3) WSs are associated with greater pain levels. There is evidence that is generally consistent (rating E) for the following research findings: 1) WSs do not correlate with psychological distress; 2) WSs are not associated with abnormal illness behavior; 3) WSs do not discriminate between organic and nonorganic problems and appear to be an organic phenomenon; and 4) WSs are not associated with secondary gain. There is inconsistent evidence (rating C) for the following research findings: 1) WSs do demonstrate inter-rater reliability; 2) WSs do not correlate with the neurotic triad of the MMPI; 3) WSs are associated with poorer surgical treatment outcome; and 4) WSs are associated with nonreturn to work. There is little or no evidence (rating D) for the following research findings: 1) WSs demonstrate test-retest reliability; 2) WSs demonstrate reliable factors; 3) WSs are associated with self-esteem, catastrophizing, and a nonorganic pain drawing. In reference to the above consistent and inconsistent findings, it is to be noted that the direction of some of the inconsistent findings supports the above consistent findings. For example, the lack of correlation with the neurotic triad of MMPI supports the consistent findings of no correlation with psychological distress, abnormal illness behavior, or self-esteem. Similarly, the inconsistent findings of poorer surgical outcome and nonreturn to work support the consistent findings of poorer physical performance and poorer treatment outcome.

#### Discussion

Waddell et al. [1] reported WSs to demonstrate high test-retest reliability and to also demonstrate high inter-rater reliability. Unfortunately, we were only able to find one study that supported test-retest reliability, which was of poor quality. We, therefore, concluded that not enough studies exist to conclude that WSs demonstrate test-retest reliability. In addition, there was also inconsistent evidence for WS inter-rater reliability. Researchers using WSs in future studies will need to report their own inter-rater reliability figures. Similarly, clinicians using WSs to make clinical diagnoses

will need to keep in mind that their findings in reference to these signs could be unreliable.

Waddell et al. [1] indicated that the "final proof of the validity of WSs depends on their value in predicting outcome of treatment." As indicated in Table 3, the evidence is consistent (rating A) that WSs are associated with decreased functional performance and poorer nonsurgical treatment outcome. In addition, the evidence, although inconsistent (rating C), indicates that WSs are associated with poorer surgical outcome and nonreturn to work. Overall, therefore, this evidence points to the validity of WSs in predicting outcome. At issue is why WSs are associated with overall treatment outcome. This issue is discussed below in reference to the results of this evidence-based review.

The presence of WSs has been thought to indicate a magnified (nonorganic problem) [3,8,9] or to indicate the presence of secondary gain issues [8-10]. These interpretations for WSs were made in spite of the fact that Waddell et al. [3] indicated that WSs were "most related to physical severity" and that "illness behavior was secondary to physical disorder and improved or deteriorated with successful or failed treatment" [15]. The results of this evidence-based review indicate that the evidence is generally consistent (rating B) in indicating that WSs cannot discriminate between organic and nonorganic problems and may be an organic phenomenon. In addition, additional evidence, which is generally consistent (rating E), indicates that WSs are not associated with secondary gain issues. Thus, these two interpretations of WSs are open to question and, therefore, may not serve as an explanation for the association of WSs with treatment outcome.

Waddell's signs have been thought to be a psychological phenomenon and, in many papers, have been called behavior signs. Waddell's signs have been thought to indicate psychological distress [3,5] or abnormal illness behavior [3], to be similar to pain behavior [6], or to be somatic amplification [7]. The reviewed evidence indicates that there is very little evidence for any of these interpretations and that all these interpretations could be wrong. There is generally consistent evidence (rating B) that these signs do not indicate psychological distress or abnormal illness behavior. Additional evidence, although inconsistent (rating C), indicates that WSs are not associated with the neurotic triad of the MMPI. Thus, to date, no firm association between psychological disturbance and WSs has been established. Therefore, psycholog-

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ical problems may not be the reason why WSs are associated with poorer treatment outcome.

It is interesting to note that the association of pain with WSs has not been a central topic of discussion in the WS literature. This association appears to have been entirely ignored in favor of a search for psychological explanations. Nevertheless, the authors were able to locate 14 studies that directly or indirectly addressed the issue of the association of pain with WSs. This evidence was amazingly consistent (rating A) in indicating an association between greater pain and the presence of WSs. What, then, is the relationship between WSs and pain levels, and can pain actually explain the presence of WSs? It appears that there is substantial literature evidence that indicates that there may be a strong relationship between some WSs and the presence of pain. This literature is reviewed below in reference to the WSs involved.

Nondermatomal sensory loss in a stocking, glove, whole leg, or whole arm distribution is one of the regional WSs [1]. Similarly, nondermatomal or nonanatomic deep tenderness not localized to one area is another WS [1]. The central concept here is the belief that both pain/tenderness and sensory loss should occur in a dermatomal distribution [75,76]. This is a belief that has been a central tenet of neurology for many years [75]. Recently, this belief has been challenged through animal experiments and human observations. Rats with a painful peripheral neuropathy have been shown to have pain in a stocking-like distribution (nondermatomal). This has been called extraterritorial pain [77], which is related to input from undamaged nerves. Similarly, tactile hypesthesia (numbness) is often associated with painful conditions. Nathan [78] and others [79] have found that, when there is a lesion in the peripheral or central nervous system causing pain or local tenderness, stimuli applied to the skin of the affected part are not clearly perceived, that is, there is numbness. This was exactly the finding of one of the studies presented in this review [67]. Nathan [78] and others [79] found that the area of this pain-related hypesthesia could be reduced or removed if the pain was relieved. Moriwski and Yuge [79] also reported that pain-associated tactile hypesthesia often spreads outside of the territory of the affected peripheral nerves responsible for the pain, that is, is extraterritorial. Finally, it is well known that trigger points in myofascial pain syndrome (MFPS) have been reported to refer not only pain/tenderness, but also numbness [80] and do not follow dermatomal referral patterns [81].

Indeed, nondermatomal sensory loss and nondermatomal deep tenderness are frequently found in MFPS [82,99]. Therefore, nondermatomal sensory abnormalities are consistent with referred MFPS phenomena. These observations on MFPS referral patterns recently were bolstered by one human experimental study. In that study, it was found that ongoing muscle pain could cause sensory changes in the referred pain area [83]. This short review indicates that both pain and numbness can be nondermatomal, that is, extraterritorial. In addition, MFPS can lead to nondermatomal phenomena. As such, these studies call into question the validity of a nonorganic interpretation for the WSs of nondermatomal sensory loss and nondermatomal deep tenderness. It is clear that these signs may not be a nonorganic phenomenon, as was postulated in the early literature, and may be explainable by the presence of pain.

Another WS that may not have a nonorganic etiology, but may be related to pain, is that of regional weakness. In this sign, muscle groups, also in a nondermatomal distribution, appear weak, for example, the whole arm. However, recent human evidence [84,85] has shown that acute stimulation of nociceptive muscle afferents can inhibit single motor unit activity without changing recruitment order and, thus, LBP patients may experience fatigue faster than controls [86]. In a reverse of that experiment, CPPs with apparent weakness of dorsal foot flexors were restored to normal flexor strength by pain relief [34,87]. Finally, it appears that patients with pain also experience muscle fatigue faster than comparable controls [88]. In addition, the WS of regional weakness is frequently found in patients with MFPS [82]. Those studies also point to the possibility that the WS of regional weakness may have little validity as a nonorganic sign. This sign may also be related to perceived pain and pain-associated phenomena.

Two other WSs that may not have a nonorganic etiology, but may be related to pain, are tenderness (superficial skin tenderness to light touch) and overreaction (disproportionate facial or verbal expression to examination). Recent studies demonstrated that fibromyalgia syndrome (FMS) patients, compared with controls, have greater sensitivity to pressure pain [87] and greater sensitivity to pressure pain and light touch at the site of maximal pain compared with the contralateral side [87]. Similarly, MFPS patients have been demonstrated to have qualitatively altered nociceptive processes in highly tender muscles [88]. In



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addition, clinicians have noted that WSs are typical features seen in FMS [89]. Thus, touch hypersensitivity (superficial skin tenderness to light touch as a WS) may be a normal clinical finding in FMS and/or MFPS. These touch hypersensitivity findings in these syndromes may indicate neuronal changes associated with central sensitization [90]. How do these observations relate to the WS of overreaction? A recent study [91] demonstrated, by multiple regression analyses, that high pain and high pain behavior (overreaction) were both independently related to tender point scores in FMS. Thus, tender point scores may be related to the superficial skin tenderness to light touch WS and to the overreaction WS. These two WSs may, therefore, have little validity as nonorganic signs and may, thus, be related to perceived pain and pain-associated phenomena.

The above discussion indicates that five WSs (nondermatomal sensory loss, nondermatomal deep tenderness, regional weakness, superficial skin tenderness to light touch, and overreaction) out of eight may not have nonorganic etiologies and may be related to pain. Thus, this evidence indirectly supports the finding in this study on the importance of the association of pain with WSs.

One of the purposes of a structured, evidence-based review is to note some systematic methodological problems in the reviewed studies. From the above discussion, it is obvious that, in clinical studies comparing patients for WSs, one needs to control for pain levels. None of the above studies demonstrated this kind of analysis. In addition, one also needs to control for the presence of FMS and MFPS or eliminate patients with these diagnoses from the analyses groups. None of the reviewed studies used this approach. There is also some evidence in the recent literature that complex regional pain syndrome (CRPS) can be related to nondermatomal sensory abnormalities [92,93]. None of the reviewed studies controlled for the presence of CRPS.

Another methodological problem noted in the reviewed studies was that of the issue of gender. The majority of the reviewed studies did not control for gender, and some studies did not report a sex break down [22]. Some studies, however, did control for gender by reporting on men only [32], while some other studies actually compared men with women for WSs [1,15,22,25,46,63]. Some of those studies [22,25,63] reported a higher frequency of WSs in women. This finding is not surprising. There is a higher

frequency of FMS within females. Thus, these findings support the possibility of a systematic error in the reviewed studies related to gender. Future WS studies will need to control for gender.

Another methodological problem noted in the reviewed studies was that of acute pain versus chronic pain. The reviewed studies varied according to the type of pain syndrome studied. For example, some studied acute LBP, some studied chronic LBP, some studied CPPs, not indicating what types of pain syndromes were involved, and finally, some studies used both acute and chronic LBP (Appendices 18-20). The issue of not controlling for the type of pain is problematic. This is because, as indicated in Appendices 18 and 19, there may be differences in the frequencies of WSs among these types of pains. As such, future WS studies will need to avoid mixing chronic and acute pain and specify clearly the groups studied. One last issue relates to WSs and chronic versus acute pain. Some authors [94] have claimed that WSs are positive physical findings confirming the diagnosis of chronic pain. As can be seen from Appendices 18 and 19, WSs are present in acute pain as well. As such, WSs are not positive physical findings confirming chronic pain and should not be used in this manner.

Another systematic methodological problem noted in the reviewed studies was that of nonconsistent identification of the patients exhibiting WSs. In the original study [1], Waddell et al. suggested that the presence of three out of five WS categories indicated psychological distress. Yet subsequent researchers [2,16,21,22,23,26,27,29,30,32,33,45-50,52,54-58,60,62-66], in addition to using WS categories, have used other approaches. These have been the average numbers of WSs [14,59], a modified Waddell Score [17], some WSs only [5,18-20,24,25,30,35-44,51,53,67-70], the somatic amplification rating scale (SARS) [7], different cutoffs for WS score categories [3,22,28,31,32], and, simply, the presence of WSs [61]. As such, this body of literature suffers from lack of consistency in using a WS method for identifying the "distressed" patient.

There are a number of problems with this review, which relate to the class of review that this review represents. There are four classes of research reviews [95]. In the first class, new developments in a field are identified and discussed. The second class of review uses empirical evidence to highlight, illustrate, or assess a particular theory or, tentatively, to propose a new theoretical framework. In the third class of review, a reviewer can

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organize knowledge from divergent lines of research. The fourth class of review is called the integrative type. In that type of review, the reviewer is "primarily interested in inferring generalizations about substantive issues from a set of studies directly bearing on those issues" [96]. Meta-analysis belongs to the fourth class of review. This review belongs to the third class of review [97]. As such, it is subject to the usual problems associated with traditional reviews. The problem with traditional reviews usually relates to the fact that these reviews use a vote-counting approach for summarizing outcomes of individual studies. The results of statistical tests of significance in the reviewed studies are counted, and the tally is used as a basis to draw inferences about the consistency of outcomes. This vote-counting procedure is flawed in two major ways. First, the vote-counting procedure divides the decision of the results of the studies into two groups while not providing any indication of the strength of relationships or magnitude of differences that distinguishes groups and does not necessarily take into account the quality of the reviewed studies [98]. We have attempted to control for this last problem. Second, the vote-counting method can lead to erroneous conclusions when the statistical power in individual empirical studies is low [98]. Because this review used the vote-counting method, the limits of the conclusions drawn from it should be appreciated. Definitive answers to the questions asked in this review, therefore, await the possible application of meta-analysis to the studies brought together in this review.

**Conclusions**

This structured, evidence-based review of the WS literature utilizing AHCPR guidelines for levels of evidence has lead to the following conclusions: 1) WSs do not correlate with psychological distress; 2) WSs do not discriminate organic from non-organic problems; 3) WSs may represent an organic phenomenon; 4) WSs are associated with poorer treatment outcome; 5) WSs are associated with greater pain levels; 6) WSs are not associated with secondary gain; and 7) WS studies, as a group, demonstrate some methodological problems.

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## SPECIAL TOPIC SERIES

## Is There a Relationship Between Nonorganic Physical Findings (Waddell Signs) and Secondary Gain/Malingering?

David A. Fishbain, MD, FAPA, \*†‡§ R. B. Cutler, PhD, \*§ H. L. Rosomoff, MD, DMedSc, FAAPM, †‡§  
and R. Steele Rosomoff, BSN, MBA†‡§

**Abstract:** This is a structured evidence based review of all available studies addressing the concept of nonorganic findings (Waddell signs) and their potential relationship to secondary gain and malingering. The objective of this review is to determine what evidence, if any, exists for a relationship between Waddell signs and secondary gain and malingering.

Waddell signs are a group of 8 physical findings divided into 5 categories, the presence of which has been alleged at times to indicate the presence of secondary gain and malingering. A computer and manual literature search produced 16 studies relating to Waddell signs and secondary gain or malingering. These references were reviewed in detail, sorted, and placed into tabular form according to topic areas, which historically have been linked with the alleged possibility of secondary gain and malingering: 1) Waddell sign correlation with worker compensation and medicolegal status; 2) Waddell sign improvement with treatment; 3) Waddell sign correlation with Minnesota Multiphasic Personality Inventory validity scores; and 4) Waddell sign correlation with physician dishonesty perception. Each report in each topic area was categorized for scientific quality according to guidelines developed by the Agency for Health Care Policy and Research. The strength and consistency of this evidence in each subject area was then also categorized according to Agency for Health Care Policy and Research guidelines. Conclusions of this review were based on these results. There was inconsistent evidence that Waddell signs were not associated with worker's compensation and medicolegal status; there was consistent evidence that Waddell signs improved with treatment; there was consistent evidence that Waddell signs were not associated with invalid paper-pencil test; and there was inconsistent evidence that Waddell signs were not associated with physician perception of effort exaggeration. Overall, 75% of these reports reported no association between Waddell signs and the 4 possible methods of identifying patients with secondary gain and/or malingering.

Based on the above results, it was concluded that there was little evidence for the claims of an association between Waddell signs and

secondary gain and malingering. The preponderance of the evidence points to the opposite: no association.

**Key Words:** nonorganic physical signs, Waddell signs, nondermatomal sensory abnormalities, malingering, chronic pain, secondary gain

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Forms of fraud relating to matters of health can be broadly defined as disability exaggeration or malingering.<sup>1</sup> More specifically, it is the false or fraudulent exaggeration or simulation of physical or mental disease.<sup>1</sup> The *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV)<sup>2</sup> has defined malingering as "the intentional production of false or grossly exaggerated physical or psychologic symptoms motivated by external incentives, such as avoiding military duty, avoiding work, obtaining financial compensation, evading criminal prosecution, or obtaining drugs." Because of the intentionality of the act, malingering is not classified as a mental disorder in the DSM-IV.<sup>2</sup> It is placed within conditions that may be a focus of clinical attention for reasons of noncompliance or other reasons. Incentives, which are the motivation for malingering, have been termed secondary gains.<sup>3</sup> Secondary gain has been defined as "acceptable or legitimate interpersonal advantages that result when one has the symptom of a physical disease."<sup>3,4</sup> Secondary gains are necessary for malingering to occur, but it is important to remember that secondary gains can be present in patients who are not malingering.<sup>3</sup> The senior author has previously reviewed secondary gain research<sup>3,4</sup> and malingering research.<sup>5</sup>

There are basically 2 types of malingering: commissions and omissions. Commissions are conscious distortions of problems, events, and symptoms that have not occurred or are functionally less significant than the patient has portrayed. Omissions involve withholding important material despite direct inquiry into an area by the physician or failing to offer salient information when it has not been specifically requested, but clearly would be important to the inquiry.<sup>6</sup> There are a number of different types of malingering under the category of commissions: pure, positive, partial, and false imputation. Pure malingering is the feigning of disease or disability when it does not exist. Positive malingering (simulation) is the feigning of symptoms that do not exist. Conscious exaggeration of symptoms

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From the \*Department of Psychiatry, University of Miami School of Medicine, Miami Beach, FL; †Department of Neurological Surgery, University of Miami School of Medicine, Miami Beach, FL; ‡Department of Anesthesiology, University of Miami School of Medicine, Miami Beach, FL; and §University of Miami Comprehensive Pain & Rehabilitation Center at South Shore Hospital, Miami Beach, FL.

Reprints: David A. Fishbain, MD, FAPA, 600 Alton Road, Miami Beach, FL 33139 (e-mail: d.fishbain@miami.edu).

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that do exist has been termed partial malingering. The ascribing of actual symptoms to a cause consciously recognized to have no relationship to the symptoms is termed false imputation. Under the category of omissions is dissimulation. Here, symptoms are concealed or minimized for secondary gain reasons.

Malingering is of great concern to the physician, other health practitioners, and especially to the pain physician. The pain physician often deals with the chronic pain patient (CPP) who is involved in litigation and, thus, the issue of secondary gain surfaces.<sup>3-4</sup> In addition, the pain physician also frequently deals with the CPP who is receiving some form of disability benefits, such as worker's compensation benefits. Thus, again the issue of secondary gain may surface,<sup>3,4</sup> leading to concerns over the possibility of malingering being present. This concern on the part of the pain physician has been noted by some authors<sup>8</sup> to be of such proportion that they have termed it "malingeringophobia" and have tried to describe its associated features. Researchwise, it is, therefore, important to determine the factors involved in the pain physician's perceptions for the possibility of malingering in his or her CPP. It is believed that often, part of this perception can be traced to the presence of nonorganic signs in the CPP.

During the 1980s, Waddell et al<sup>2-11</sup> studied a group of patients with low back pain (LBP) with physical signs frequently found in CPPs. These signs earlier in this century were identified as predominantly nonorganic and as such were thought to represent either malingering or hysteria.<sup>12</sup> Waddell et al<sup>2</sup> standardized these signs in CPPs and placed them into 5 general categories (tenderness, simulation, distraction, regional, and overreaction). In all, they listed 8 signs under these 5 general categories (Table 2). Waddell et al<sup>9</sup> also determined that these signs were reliable and valid for predicting psychologic problems and suggested that if a CPP demonstrated 3 or more categories of nonorganic signs that the CPP should be evaluated for psychologic problems. Fishbain et al<sup>13</sup> have also recently reviewed this issue.

The interpretation of these nonorganic signs, henceforth called Waddell signs (WS), and their exact meaning has been fraught with difficulty. The presence of WS has been thought to indicate psychologic distress<sup>11,14</sup> and a more "magnified or more emphatic presentation of the severity of their problem."<sup>11</sup> It was also proposed that WS should draw attention to the possibility of abnormal illness behavior,<sup>11</sup> which was defined by Waddell<sup>13</sup> as "maladaptive overt illness-related behavior which is out of proportion to the underlying physical disease and more readily attributable to associated cognitive and affective disturbance." WS have also been equated with pain behavior and have been presented as a pain behavior assessment tool.<sup>15</sup> Finally, some other researchers have also equated WS with "somatic amplification."<sup>16</sup> Unfortunately, some of the above words such as "magnified" and "out of proportion" have led some authors and clinicians<sup>17,18</sup> to revert to the original interpretation of WS: malingering or pain of psychologic ori-

gin. For example, in a recent review<sup>19</sup> on detecting sincerity of effort, WS are listed as one of the "widely" used methods to determine sincerity of effort. This has led Main and Waddell<sup>20</sup> to attempt to reappraise the interpretation of WS. Nevertheless, it appears that the presence of WS in a CPP raises the possibility of malingering in the minds of some physicians. Thus, the purpose of this evidence-based, structured review, which is an integrative type of review but not a meta-analysis, was the following: to determine if any evidence exists for the interpretation of WS as being associated with secondary gain and thus possibly malingering and to evaluate the strength of that evidence through an evidence-based structured review process utilizing Agency for Health Care Policy Research (AHCPR) guidelines for review of research evidence<sup>21</sup> (Table 1).

## METHODS

Relevant references were located by the procedure to follow. MEDLINE, Psychologic Abstracts, Science Citation Index, and the National Library of Medicine Physician Data Query (PDQ) databases were reviewed utilizing the following 13 subject headings: nonorganic physical signs; Waddell signs; nondermatomal sensory abnormalities; sensory loss stocking; sensory loss glove; physical findings, distraction; nonanatomic tenderness; illness behavior; conversion symptoms; disease magnification; abnormal illness behavior; pain behavior; and somatic amplification. Each of these was exploded with the medical subject heading (MESH) "pain." Each term was exploded for subheadings in MESH and all retrieved references reviewed. The searches were not restricted to the

TABLE 1. Levels of Evidence as Applied by the Agency for Health Care Policy and Research for Guideline Development<sup>21</sup>

- A. Type of evidence guidelines
  - I. Meta-analysis of multiple, well-designed controlled studies
  - II. At least 1 well-designed experimental study
  - III. Well-designed, quasiexperimental studies such as nonrandomized, controlled, single group prepost cohorts, time series, or matched case-controlled studies
  - IV. Well-designed nonexperimental studies, eg, comparative, correlational, descriptive, case control
  - V. Case reports and clinical examples
- B. Strength and consistency of evidence guidelines
  - A. There is evidence of type I or consistent findings from multiple studies of type II, III, or IV
  - B. There is evidence of type II, III, or IV, and findings are generally consistent
  - C. There is evidence of type II, III, or IV, but findings are inconsistent
  - D. There is little or no evidence, or there is type V evidence only
  - E. Panel consensus: practice recommended on the basis of opinion of experts in pain management

Table 2. Waddell's Nonorganic Signs

|  |
|--|
| <b>Tenderness</b>  |
| Superficial skin tender to light touch   |
| Nonanatomic deep tenderness not localized to one area  |
| <b>Simulation</b>  |
| Axial loading pressure on the skull of a standing patient induces lower back pain                              |
| Rotation: shoulders and pelvis rotated in same plane induces pain  |
| <b>Distraction</b>   |
| Difference in straight leg raising in supine and sitting positions   |
| <b>Regional</b>  |
| Weakness: many muscle groups, "give-away weakness" (patient does not give full effort on minor muscle testing) |
| Sensory: sensory loss in a stocking or glove distribution, nondermatomal                                       |
| <b>Overtreaction</b>   |
| Disproportionate facial or verbal expression (ie, pain behavior)   |

English language and were conducted back to 1966, except for Science Citation Index, which was conducted back to 1974. The upper limit of each search was 2001. A manual search was also performed using key pain journals, pain meeting abstracts, and textbooks. For the following journals, the following years were reviewed: *Pain*, 1975 to 2001; *Spine*, 1976 to 2001; *Journal of Pain and Symptom Management*, 1986 to 2001; *The Pain Clinic*, 1986 to 2001; and *Clinical Journal of Pain*, 1985 to 2001. Abstract books of the following meetings were reviewed for the following years: International Association for the Study of Pain, 1981, 1984, 1987, 1990, 1993, 1996, and 1999; and American Pain Society Meetings, 1982 to 2001. Three pain textbooks were reviewed for possible references. These were: *Evaluation and Treatment of Chronic Pain*, 3rd edition, G. Aronoff, editor, 1999; *Handbook of Pain Management*, 2nd edition, C.D. Tollison, J.R. Satterthwaite, and J.W. Tollison editors, 1994; and *Textbook of Pain*, 3rd edition, P. Wall and R. Melzak, editors, 1993. Ninety-eight references were found in this manner and were subject to a cursory review. Of these, 39 either did not relate to the subject area (WS) or used other concepts such as nonorganic symptoms or related to disability issues. Of the 59 remaining studies, 16 studies<sup>9,16,22-35</sup> were construed to directly or indirectly address the issue of secondary gain and malingering and WS.

For the purposes of this review, the possibility of having secondary gains and thereby the possibility of being a malingerer was operationally defined as: 1) being a patient on worker's compensation (WC) and/or being in active litigation; 2) no improvement of WS with treatment; 3) performance on paper-pencil tests indicating that that performance may be affected by secondary gain issues; and 4) physician dishonesty perception. It is to be noted that the presence of any of these issues has not been definitively demonstrated as being indicative of malingering, but could demonstrate an increased likelihood. The

above 16 studies broke down naturally into the above operationally defined secondary gain topic areas. Thus, the 16 studies were grouped into tables organized according to these topic areas. Some of the above studies addressed a number of operational definitions of secondary gain and malingering. As such, some of these studies<sup>8,16,23,24,26,27</sup> were used more than once. These studies are highlighted with an asterisk in the tables. Data for each table, in each topic area, was abstracted from each study according to the following format: reference number, research question, study design, sample size, nonorganic findings outcome measure, statistical analysis, results, categorization of the type of evidence the study represented (according to Table 1), and reviewer's comments. The categorization of the type of evidence the study represented was based on the guidelines developed for the AHCPR for categorizing the levels of evidence represented by the reviewed studies<sup>21</sup> (Table 1). Studies were categorized I through V according to this scheme. Here, I represents a meta-analysis of well-designed, controlled studies and V represents a case report or clinical example. The categorizations are objective in nature, requiring no interpretation. The strength and consistency of the research evidence in each group of studies in each table, utilizing the categorizations of each study as provided by Table 1 was then also categorized according to AHCPR guidelines<sup>21</sup> (Table 1) developed for this purpose. In Table 1, A represents consistent findings from multiple studies, whereas E represents panel consensus only. It is to be noted that as this study is not a meta-analysis, the data was abstracted into tabular form by the senior author only. No coding techniques were used and study quality was not rated. Only data pertaining to the problem area were abstracted. As the AHCPR categorizations are objective in nature, requiring no interpretation, the senior author was the only researcher to identify the type of study each study represented according to Scale A (Table 1) and to identify the strength and consistency of the evidence represented by each group of studies according to Scale B (Table 1).

## RESULTS

Table 3 presents the 8 studies,<sup>9,16,23-25,27,28,31</sup> 3 of which<sup>15,23,27</sup> were used more than once for a total of 11 reports on this topic area. All 8 studies in this group represented type III evidence (Table 3). Of these 11 reports, 6<sup>8,16,23,25,28</sup> (54.5%) reported no association between the presence of WS and WC or medicolegal status. The rest (45.5%) reported such an association. Based on these observations and according to the AHCPR Rating Scale B, the consistency of this evidence for WS not being associated with worker's compensation status or medicolegal status was categorized as C. (There is evidence of type II, III, and IV studies, but the findings are inconsistent.)

Table 4 presents 6 studies,<sup>22,24,26,33-35</sup> 2 of which<sup>24,26</sup> were used more than once for a total of 8 reports on this topic area. All 6 studies in this group represented type III evidence (Table 4) except for 1,<sup>34</sup> which represented type IV evidence. Of these 8 reports, all 8 (100%) either reported an improve-



TABLE 3. Does the Presence of WS Correlate With Worker's Compensation/Medicolegal Status?

| Reference No. | Research Question   | Study Design  | Sample Size                  | Nonorganic Findings Measure   |
|---------------|---|---|------------------------------|---|
| 9             | Do WS correlate with WCS or with AIS?   | WCS and MS CPPs compared to others for frequency of WS  | 304 CLBP                     | WS categories   |
| 27            | Do WS predict membership in patient groups: AFC vs. do not have AFC?  | WS measured in patients who do and do not   | 231 CLBP                     | WS categories   |
| 27            | Within patient groups who do and do not AFC, do WS correlate with inconsistency scores on the LIQ?                    | WS and LIQ completed; inconsistency scores determined   | 231 CLBP                     | WS categories   |
| 16            | Do WCS patients have higher SARS scores?  | SARS completed; WCS determined  | 127 CLBP                     | Individual WS making up SARS  |
| 16            | Is litigation status associated with elevated SARS scores?  | SARS completed; litigation status determined  | 120 CLBP                     | Individual WS making up SARS  |
| 23            | Does litigation status discriminate the incongruent CLBP patient?   | Incongruent CLBP patients defined as 2 or more WS; 3 or more inappropriate symptoms; score greater than 5 on pain drawing; compared to congruent CLBP patients for litigation status? | 40 CLBP                      | Defined under study design  |
| 24            | Are the invalid group (2 or more WS) more likely to have a lawyer vs. the valid group (zero WS)?                      | WS determined; lawyer status determined   | 30 (valid)/10 (invalid) CLBP | WS categories   |
| 28            | Does WCS influence the performance of WS in identifying "disturbed" patients as measured by a combination of 8 tests? | WS determined; 7 other tests completed; disturbed patients identified; influence of compensation status on identification of these patients calculated                                | 300 both acute and CLBP      | WS categories; different cutoff criteria from Waddell and different for men and women |
| 25            | Are WS more frequent in WCS or MS patients?   | WS determined; WCS and MS status determined   | 651 acute and CLBP           | WS categories   |
| 31            | Are WS associated with medicolegal proceeding?  | Patients evaluated for WS presurgery and postsurgery  | 290 CLBP                     | WS categories   |
| 25            | Does WCS discriminate the incongruent CLBP patients?  | Incongruent CLBP patients defined as 2 or more WS; 3 or more inappropriate symptoms; score greater than 5 on pain drawing; compared to congruent CLBP patients for WCS                | 40 CLBP                      | Defined under study design  |

WCS, worker's compensation status; MS, medicolegal status; CLBP, chronic low back pain; AFC, anticipated financial compensation; LIQ, life impact questionnaire; SARS, Somatic Amplification Rating Scale.

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TABLE 3. (continued) Does the Presence of WS Correlate With Worker's Compensation/Medicolegal Status?

| Reference No. | Statistical Analysis             | Results   | Type of Evidence | Reviewers' Comments                   |
|---------------|----------------------------------|---|------------------|---------------------------------------|
| 9             | Correlation                      | WS equally common between controls and WCS/MIS patients   | III              | WS not associated with secondary gain |
| 27            | Discriminate analysis            | WS correctly classified 90% of patients   | III              | WS associated with secondary gain     |
| 27            | Pearson correlation coefficients | For the AFC group, 59 correlations between LIQ and WS; for the nongroup, 17 correlations between LIQ WS | III              | WS associated secondary gain          |
| 16            | $\chi^2$                         | WCS patients were found to have statistically higher SARS scores  | III              | WS associated with secondary gain.    |
| 16            | $\chi^2$                         | Litigation status not associated high SARS scores   | III              | WS not associated with secondary gain |
| 13            | Discriminate analysis            | Litigation status did not discriminate between groups.  | III              | WS not associated with secondary gain |
| 24            | $\chi^2$                         | Invalid group more likely to have a lawyer  | III              | WS associated with secondary gain     |
| 28            | Multivariate analysis            | WCS does not influence the performance of WS in identifying disturbed patients                          | III              | WS not associated with secondary gain |
| 25            | $\chi^2$                         | WS not more frequent in WCS or MIS patients   | III              | WS not associated with secondary gain |
| 31            | Regression                       | Regression answered 50.1% of variance for WS of which 9.2% related to medicolegal proceedings           | III              | WS associated with secondary gain     |
| 23            | Discriminate analysis            | WCS does not discriminate between the 2 groups  | III              | WS not associated with secondary gain |

ment in WS scores with treatment,<sup>22,34-35</sup> compliance with treatment,<sup>24</sup> or improvement in self assessment.<sup>26</sup> Based on these observations and according to the AHCPR Guidelines Scale B, the consistency of this evidence for patients with WS unimproving with treatment was categorized as B. (There is evidence of type II, III, and IV studies, and the evidence is generally consistent.)

Table 5 presents 3 studies<sup>9,24,32</sup> for a total of 3 reports on this topic area. All 3 (100%) studies in this group represented type II evidence (Table 5). Of these 3 studies, all 3 reported no association between WS scores and paper-pencil validity scale scores. Based on these observations and according to AHCPR Guidelines Scale B, the consistency of this evidence for no

association between WS scores and paper-pencil validity scores was categorized as B. (There is evidence of type II, III, and IV studies, and the evidence is generally consistent.)

Table 6 presents 2 studies,<sup>29,30</sup> none of which were used twice, for a total of 2 reports on this topic area. Both studies in this group represented type III evidence (Table 6). One (50%) of these studies<sup>29</sup> indicated that WS did not identify the "dishonest" CPP, whereas the other<sup>30</sup> indicated that WS were associated with an effort at exaggeration based on physician perception. Based on these observations and according to the AHCPR Guidelines Scale, the consistency of this topic area for no association of WS with physician dishonesty perception

TABLE 4. Do WS Improve With Treatment?

| Reference No. | Research Question   | Study Design   | Sample Size                   | Nonorganic Findings Measure |
|---------------|---|--|-------------------------------|-----------------------------|
| 33            | Are WS stable?  | Patients evaluated for WS presurgery and postsurgery   | 85 acute and CLBP             | WS categories               |
| 34            | Is there a relationship between patient clusters determined by WS and other variables and surgical treatment outcome? | CPPs placed into 4 clusters according to WS and other indicators of distress, clusters compared for surgical outcome                             | 98 CPPs                       | WS categories               |
| 35            | Does treatment change WS scores?  | WS recorded in 2 groups of CLBP patients (those receiving standard PT and those receiving PT plus motivational therapy) at entrance and at 4 mos | 93 CPPs                       | Modified WS                 |
| 26            | Do patients with high WS improve their performance on dynamometry with treatment?                                     | WS and dynamometry performance determined at beginning and end of treatment  | 40 CLBP                       | WS categories               |
| 24            | Does the invalid group (2 or more WS) comply with treatment vs. the valid group (zero WS)?                            | WS determined; lawyer status determined  | 30 (valid); 10 (invalid) CLBP | WS categories               |
| 26            | Do WS improve with treatment?   | WS determined at beginning and end of treatment program  | 48 CLBP                       | WS categories               |
| 26            | Does self-assessment improve with treatment in patients with high WS?   | WS and self-assessment determined at beginning and end of program  | 45 CLBP                       | WS categories               |
| 22            | Do WS improve with treatment?   | CPPs evaluated at admission and at completion treatment for WS   | 30 CLBP                       | Total number WS             |

CLBP, chronic low back pain; ANOVA, one-way analysis of variance; CPP, chronic pain patients; PT, physical therapy.

was categorized as C. (There is evidence of type II, III, and IV studies, but the evidence is generally inconsistent.)

If Tables 3 through 6 were collapsed, there would represent 24 reports. Of these 24 reports, all represented type III evidence except 1,<sup>34</sup> which represented type IV evidence. Of these 24 reports, 75% did not report an association between WS and secondary gain. Based on these observations and according to the AHCPR Guidelines Scale, the consistency of this evidence for no association between WS and alleged secondary gain was categorized as C. (There is evidence of type II, III, and IV studies, but the findings are inconsistent.)

## DISCUSSION

This structured review has attempted to critically examine the available study evidence on the association of alleged secondary gain variable and WS. This study was undertaken because of the implied association that is still present in the literature of WS and secondary gain and malingering.<sup>19</sup>

Worker's compensation status and litigation status has been historically linked with the presence of secondary gain<sup>3,4</sup> and thus the possibility of malingering. This is the reason why such studies were grouped in Table 3. As noted in the *Results*, although inconsistent, there was more evidence in this group of studies for no association between these variables and WS.

TABLE 4. (continued) Do WS Improve With Treatment?

| Reference No. | Statistical Analysis | Results   | Type of Evidence | Reviewers' Comments                             |
|---------------|----------------------|---|------------------|---|
| 33            | $\chi^2$             | Significant improvement in some WS post surgery if surgery successful ( $\downarrow$ pain)      | III              | If related to secondary gain, should not change |
| 34            | Percentage           | Of 7 patients, in an abnormal cluster 5 moved to normal cluster (71.4%)                         | IV               | If related to secondary gain, should not change |
| 35            | $\chi^2$             | Modified WS significantly improved in both groups at 4 mcs                                      | III              | If related to secondary gain, should not change |
| 36            | ANOVA                | Performance in both low and high WS groups improved significantly                               | III              | WS not associated with secondary gain           |
| 24            | $\chi^2$             | Invalid group compliant (not expected)  | III              | WS not associated with secondary gain           |
| 26            | Percentage           | Of 7 patients with high WS score 71.4% decreased score: 4.4% increased score: 24.2% stayed same | III              | WS not associated with secondary gain           |
| 26            | $\chi^2$             | Improvement in self-assessment higher for high WS patients                                      | III              | WS not associated with secondary gain           |
| 22            | Paired tests         | In general all categories WS decreased  | III              | WS not associated with secondary gain           |

TABLE 5. Are WS Correlated With MMPI Invalid Scores?

| Reference No. | Research Question  | Study Design  | Sample Size                  | Nonorganic Findings Measure |
|---------------|--|---|------------------------------|-----------------------------|
| 32            | Do patients with elevated WS have higher MMPI validity scale scores?                                 | Patients evaluated for WS and with MMPI                         | 75 CPPs                      | WS categories               |
| 9             | Are patients with WS more likely to demonstrate MMPI elevations of validity scale scores?            | CPPs with and without WS compared on MMPI validity scale scores | 304 CLBP                     | WS                          |
| 24            | Does the invalid group (2 or more WS) generate invalid scores on MMPI vs. the valid group (zero WS)? | WS determined; MMPI scores determined                           | 30 (valid):10 (invalid) CLBP | WS categories               |

| Reference No. | Statistical Analysis                | Results  | Type of Evidence | Reviewers' Comments                   |
|---------------|-------------------------------------|--|------------------|---------------------------------------|
| 32            | Pearson product moment correlations | No correlation MMPI-2 validity scales and elevated WS scores | III              | WS not associated with secondary gain |
| 9             | Correlation                         | No correlation between MMPI validity scores and WS           | III              | WS not associated with secondary gain |
| 24            | $\chi^2$                            | No significant difference validity scales between groups     | III              | WS not associated with secondary gain |

CLBP, chronic low back pain.

If an individual was malingering WS, then those signs should not change, improve, or disappear with treatment. This is the rationale for utilizing the studies presented in Table 4. Here, all 8 reports indicated that WS improved with treatment. This evidence was extremely consistent.

On paper-and-pencil tests such as the Minnesota Multiphasic Personality Inventory (MMPI), validity scales are often used to identify those patients who may complete the test randomly or exaggerate their responses. This was the rationale for choosing this group of studies (Table 5). Here again, the studies were consistent in indicating no relationship between the presence of WS and invalid paper-pencil tests.

The last group of studies (Table 6) addressed the issue of whether WS correlated with physician perception of honest or dishonest effort. Here, the studies were inconsistent in indicating no relationship between WS and physician perceptions.

Overall, each of these 4 groups of studies can be construed to address the issue of the association of WS and secondary gain in different ways. Thus, these studies were also collapsed into 1 group. Here, the results indicated that 75% of the 24 reports did not find an association between WS and the operational definitions of secondary gain and malingering. Thus, although inconsistent, this research indicates that there

could be little evidence for an association between WS and secondary gain and malingering and that the preponderance of the evidence points to the opposite conclusion: no association.

There are a number of problems with the nature of this review, which could have impacted on the studies used to derive the above conclusions. First, although malingering within CPPs likely does occur,<sup>5</sup> the frequency is likely very low.<sup>36</sup> Very low malingering rates could have confounded the results of the studies used in this review. Second, as pointed out in the introduction, malingering can take many forms, for example pure, positive, partial. None of the reviewed studies controlled for these types of malingering and, as such, this could have impacted on the results of these studies and thus on the results of this review. Third, although compensation status, involvement in litigation, having a lawyer, invalidating a paper-pencil test, nonimprovement with treatment, and physician dishonesty perception have historically been equated with secondary gain, and thereby malingering,<sup>3-5,13,37</sup> that relationship has never been conclusively proven.<sup>3-5</sup> Thus, the selection of the studies for this review could have been based on the assumption that there was a relationship between the variables in these studies and secondary gains and malingering where there is actually no such relationship. Fourth, in a recent review, Fishbain et



TABLE 6. Do WS Correlate With Physician Dishonesty Perception?

| Reference No. | Research Question  | Study Design   | Sample Size      | Nonorganic Findings Measure           |
|---------------|--|--|------------------|---------------------------------------|
| 26            | Do WS assist in identifying a dishonest group of LBP patients (normals coached to simulate LBP patients and acute LBP patients coached to dissimulate, ie, normals)? | Physician evaluators utilized physical findings and WS and rated subjects as: certainly N, probably N, undecided, probably Abn and certainly Abn: success rate for identification as honest vs. dishonest calculated | 41 acute LBP     | WS presence                           |
| 27            | Do WS correlate with an index made up of FCE level of effort and MD exaggeration questions?  | WS determined: FCE, level of effort determined; exaggeration perception completed by MD  | 55 CPPs          | WS categories                         |
| Reference No. | Statistical Analysis   | Results  | Type of Evidence | Reviewers' Comments                   |
| 26            | Success rate calculated for identifying dishonest group  | MD success rate 92% honest group but only 26% dishonest group  | III              | WS not associated with secondary gain |
| 27            | Correlation  | Index significant correlation with WS  | III              | WS associated with secondary gain     |

LBP, low back pain; N, normal; Abn, abnormal; FCE, functional capacity evaluation; MD, medical doctor.

al<sup>13</sup> demonstrated that WS are associated with pain, that is, CPPs complaining of significant pain are more likely to demonstrate WS. In addition, Fishbain et al<sup>13</sup> reviewed previous literature that indicated that 5 out of 8 WS may have a pain etiological explanation rather than the usual explanation of hysteria or malingering. As none of the studies included in this review controlled for pain, this factor could have confounded the results of some of these studies and thus impacted on the results of this review. Fifth, 1 study<sup>40</sup> (Table 6) used in this review examined the concept of patient effort as a measure of secondary gain. Unfortunately, patient effort can be influenced by<sup>4</sup> muscle fatigue, pain, anxiety, depression, catastrophizing, fear of pain, fear of impact perceived exertion, instruction set, misunderstanding of the degree of effort required, and interactive effects between subjects and tester. None of these factors were controlled for in this study.<sup>40</sup> Thus, this could have impacted on the results of this study and subsequently on the results of this review. Sixth, and the final problem with this review, relates to the kind of review it represents. There are 4 classes of research reviews.<sup>38</sup> In the first class, new developments in a field are identified and discussed. The second class of reviews uses empirical evidence to highlight, illustrate, or assess a particular theory or tentatively to propose a new theoretical framework. In the third class of reviews, a reviewer can organize knowledge from divergent lines of research. The fourth class of re-

views is called the "integrative type." Here the reviewer is "primarily interested in inferring generalizations about substantive issues from a set of studies directly bearing on these issues."<sup>39</sup> Meta-analysis belongs to the fourth class of reviews. The current review belongs to the third class of reviews.<sup>40</sup> As such, it is subject to the usual problems associated with traditional reviews. The problem with traditional reviews usually relates to the fact that these reviews use a vote-counting approach to summarize outcomes of individual studies. Here the results of statistical tests of significance in the reviewed studies are counted, and the tally is used as a basis to draw inferences about the consistency of outcomes. This vote-counting procedure is flawed in 2 major ways. First, the vote-counting procedure divides the decision of the results of the studies into groups while not providing any indication of the strength of relationships or of the magnitude of difference that distinguishes groups and does not take into account the quality of the reviewed studies.<sup>41</sup> Second, the vote-counting method can lead to erroneous conclusions when the statistical power in the individual empirical studies is low.<sup>41</sup> Because this review has used the vote-counting method, the limits of the conclusion drawn from this review should be appreciated. Similarly, because this review was not a meta-analysis, the reviewed studies were not rated for quality. This could also have impacted on the results of this review. A definitive answer to the questions

asked in this review, therefore, awaits the possible application of meta-analysis to the studies brought together in this review. A final potential criticism of this review relates to the fact that only the senior author "coded" the studies used in this study. This method was chosen because this review was not a meta-analysis. It is to be noted that at the present time, meta-analytic methods require 2 independent reviewers to abstract the data. If this review is to be held to the standard currently established for meta-analyses, then the lack of a second independent data abstractor could have confounded the results of this review.

What should be the future research approaches to this area? It is evident from the above discussion that this research area will not advance until the assumption that there is a relationship between variables such as worker's compensation status and secondary gain and malingering is either conclusively proven or disproven. As such, a different approach is needed. Such an approach could be the same as used in malingering research. Here, normal and pathologic groups are asked to produce submaximal effort or to fake a task.<sup>5</sup> Thus, for WS research, comparisons between CPPs with and without WS could be made in this way. Such comparisons would, however, need to control for pain<sup>12</sup> and have the appropriate control groups.<sup>5</sup> To date, there has only been 1 such study<sup>29</sup> (Table 6). This study, however, did not control for pain or have the appropriate control groups.

## CONCLUSIONS

This structured evidence-based review on the association of WS and secondary gain and malingering has led to the following major conclusion. Although inconsistent, the research evidence indicates that there is little evidence for an association between WS and secondary gain and, thereby, malingering. The preponderance of the evidence points to the opposite conclusion: no association.

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| <b>To</b>      | <b>claim</b>                             | <b>Fax Number</b>  | <b>8662858569</b>             |
| <b>From</b>    | <b>Barbara Schmidt</b>                   | <b>Date</b>        | <b>11/01/2008 01:24:15 PM</b> |
| <b>Subject</b> | <b>Dawn Rutherford #10421380 FCE cla</b> | <b>Total Pages</b> | <b>4</b>                      |

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TO: claim

FROM: L. A. C. M. I. U.

DATE: 6/5/2008 13:4 ESI

From: Barbara Schmidt@PRUDENTIAL on 11/01/2006 01:24 PM  
To: claim@8662858569@fax  
cc:  
Subject: Dawn Rutherford #10421380 FCE clarification

Hello! Here is the addendum. Let me know if you need anything else. Thanks,  
Sharon

PRUR00142



**MLS National Medical Evaluation Services, Inc.**  
An MLS Group Company

October 23, 2006

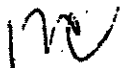
Ms. Barbara Schmidt  
PRUDENTIAL INSURANCE CO  
DISABILITY MANAGEMENT SERVICES  
290 West Mount Pleasant  
Livingston, NJ 07039

Re: Rutherford, Dawn  
Social Security Number: N/A  
Your Claim/File Number: 10421380

Dear Ms. Schmidt:

Enclosed is the Addendum Report rendered by Alan Kimelman, M.D., regarding  
Ms. Dawn Rutherford, per your request. If we can be of any further assistance,  
please do not hesitate to contact us.

Sincerely,



MLS National Medical Evaluation Services, Inc.

c: File

Enclosures

ID: claim

Name: L. A. Miller

**MLS National Medical Evaluation Services, Inc.**  
An MLS Group Company

**Supplemental Report**

Patient  
Report Date  
Date of Injury

Dawn Rutherford  
October 19, 2006  
August 15, 2001

**Identification**

On October 17, 2006 MLS requested that I clarify Dawn Rutherford's restrictions to perform repetitive finger motor or hand activities.

**Discussion**

In my previous report, I allowed that Dawn Rutherford was limited to perform repetitive finger motor or hand activities for no more than one third of the day. Objective findings to support such opinion were absent. Dawn Rutherford exhibited normal range of motion, normal neurological findings, no contractures, and no muscle atrophy. Any objective basis for basing any disability in regard to her hands was absent. With that consideration, I find that based upon objective findings, Dawn Rutherford is not restricted from repetitive finger or hand activities.

If subjective criteria is to be used as a basis for determining restrictions, then I find that Dawn Rutherford is allowed to use of her hands for repetitive activities for up to one third of an eight hour work shift.



Alan Kimelman MD  
Qualified Medical Evaluator  
Diplomat, American Board of Physical Medicine & Rehabilitation  
Diplomat, American Board of Electrodiagnostic Medicine (EMG)

TO: claim

FROM: L. A. C. Miu

## Facsimile

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| <b>To</b>      | <b>claim</b>                                | <b>Fax Number</b>  | <b>8662858569</b>             |
| <b>From</b>    | <b>Barbara Schmidt</b>                      | <b>Date</b>        | <b>09/18/2006 11:44:04 AM</b> |
| <b>Subject</b> | <b>Dawn Rutherford #10421380 IME report</b> | <b>Total Pages</b> | <b>46</b>                     |

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TO: claim

FROM: L. C. MIA

From: Barbara.Schmidt@PRUDENTIAL on 09/18/2006 11:44 AM  
To: claim@8662858569@fax  
cc:  
Subject: Dawn Rutherford #10421380 IME report

Hi Barbara-Please see attached report.

Thanks-Laureen

PRUR00146



TO: claim

FROM: L a c mlu

## MLS National Medical Evaluation Services, Inc.

An MLS Group Company

September 14, 2006

Ms. Barbara Schmidt  
PRUDENTIAL INSURANCE CO  
DISABILITY MANAGEMENT SERVICES  
290 West Mount Pleasant  
Livingston, NJ 07039

Re: Rutherford, Dawn  
Social Security Number: N/A  
Your Claim/File Number: 10421380

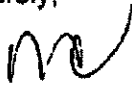
Dear Ms. Schmidt:

Enclosed is the Independent Medical Evaluation Report rendered by

Alan Kimelman, M.D., regarding Ms. Dawn Rutherford, per your request.

If we can be of any further assistance, please do not hesitate to contact us.

Sincerely,



MLS National Medical Evaluation Services, Inc.

c: File

Enclosures

IO: claim

FMW: L a c mia

## **MLS National Medical Evaluation Services, Inc.**

An MLS Group Company

### **Independent Medical Evaluation**

|                  |  |
|------------------|--|
| Patient          | Dawn Rutherford                                    |
| Evaluation Dates | July 12, 2006<br>August 2, 2006<br>August 23, 2006 |
| Date of Injury   | August 15, 2001                                    |

Thank you for referring Dawn Rutherford for an Independent Medical Evaluation in my San Rafael office.

Ms. Rutherford first presented on July 12, 2006, when she stated that she did not ingest any medication prior to the examination; she then presented on August 2, 2006, when she stated that she had taken her routine analgesic medications that day; she completed the examination on August 23, 2006, when she stated that she took medication but it felt as though she had not.

### **Sources of Information**

Interview, Dawn Rutherford, July 12, August 2, & August 23, 2006

### **Occupational Injury History**

This account is based on my interview with the patient and my review of the medical records.

Dawn Rutherford was accompanied by her husband, Dan Keegan, throughout the examination. She bore mild weight bearing on a cane and held onto her husband during her entrance and exit from the room.

10: claim

FILE: L o . mlu

Alan Kimelman MD  
July 12, August 2 & 23 2006  
Dawn Rutherford  
Page 2

Dawn Rutherford has been diagnosed with chronic fatigue syndrome, fibromyalgia, depression, anxiety, degenerative joint disease, Epstein Barr virus exposure, irritable bowel syndrome, and temporal mandibular joint dysfunction.

She last worked as a software product producer on August 15, 2001. That job entailed significant oral and written communication with clients. Physical activities included prolonged sitting, and at times working 10 to 12 hours per day. The job required meeting deadlines and working under time pressure. She frequently drove to client sites.

She started to experience nausea, back pain, headaches and flu-like symptoms of fatigue. She recalls having a fever and a sore throat. Symptoms soon included severe muscle spasm and tightening that she states *rearranged her bones* such that she felt her body was misaligned. X-rays of the lumbar sacral spine revealed normal findings in 2001.

On September 14, 2001, Dr. Maury Schulkin at Petaluma Valley Hospital reported treatment for a medication overdose. However, Dawn Rutherford and her husband state that the condition involved intolerance to a newly prescribed drug. Although Dr. Schulkin noted occasional smoking of marijuana, both Dawn Rutherford and her husband denied such.

Back pain with radiating shooting symptoms to the right lower extremity continued and, on September 18, 2001, magnetic resonance imaging revealed mild facet joint degenerative changes seen bilaterally from L3 through S1 and no evidence of significant disc bulging or herniation.

Neck pain and muscle spasm also brought discomfort. On September 25, 2001, x-rays revealed mild degenerative narrowing with marginal osteoporosis at C6-C7 and mild degenerative narrowing of the C5-C6 intervertebral region. No significant neural foraminal encroachment or other bony lesions were identified. Dr. Meseroll, who evaluated the images, attributed reversal of the normal cervical lordotic curvature to spasm positioning.

Psychologist Barbara Badham reported that the combination of physical demands at 10-12 hours per work day, exceptionally high levels of stress, and instability in the field of technology, demonstrated by the fact that Ms. Rutherford had been laid off six times since 1999, contributed to her acute anxiety and depression.

On September 26, 2001, Dr. Kurtz evaluated Dawn Rutherford for fibromyalgia, placed her on temporary total disability, and prescribed physical therapy. Her physical therapist reported spinal pain with radiating symptoms to the legs and fatigue. Dawn Rutherford recalls hypersensitivity in her ankles and feet when walking.

ID: claim

FBI: L a. mlu

Alan Kimelman MD  
July 12, August 2 & 23 2006  
Dawn Rutherford  
Page 3

Dr. Jeffrey Mandel of Hayward stated he first diagnosed Ms. Rutherford on October 24, 2001 for fibromyalgia and chronic fatigue syndrome. He reported that fatigue accompanied by numerous other painful syndromes starting in August 2001.

On November 28, 2001, Dr. Mandel stated that Ms. Rutherford's overall health had not improved. She continued to experience pain upon awakening. She indicated pain particularly in the lower lumbar, cervical and head areas, which greatly inhibited her ability to function normally throughout the day. Dawn Rutherford recalled neuropathic findings with lack of strength in the arms and hands, especially the right hand. She also had difficulty grasping objects, hot and aching pain in the joints and knuckles as well as difficulty walking on occasion. Calf muscles became increasingly stiff and rigid with spasms several times throughout the day and evening. Further limitations included use of the legs due to numbness, pain in the knee joints and numbness in the upper right leg. She recalls that her left hip was extremely troublesome when sitting or walking. She also noted sciatic pain down her legs while sitting, walking or standing. Ms. Rutherford reported extreme sensitivity around the tender points especially on the shoulders (front and back areas), neck, lower frontal torso, lower back, knees and hips. She experienced difficulty standing up from a toilet due to knee and hip pain and weakness.

She continued to suffer from a sore throat and earache the week of the exam and reported irritable bowel and nausea for two weeks. No medication was provided. She continued to experience disabling fatigue. Dr. Mandel denoted a disturbed sleep pattern as a result of ongoing anxiety related to her illness. She was suffering from non-restorative sleep.

Ms. Rutherford also continued to battle an ongoing dispute with her insurance regarding her disability. Dr. Mandel reported that the dispute over Ms. Rutherford's disability only served to exacerbate her condition and hinder improvement of her already fragile state.

Dr. Mandel concluded that Ms. Rutherford continued to be completely and totally disabled for a minimum period of six months to a year. Meanwhile, he prescribed a patch, that Dawn Rutherford recalls experiencing an adverse reaction. She recalls receiving epinephrine to reduce the allergic reaction.

On December 17, 2001, Dr. Kurtz prescribed a functional capacity evaluation but no insurance authorized payment.

On December 20, 2001, Dr. Mandel noted Ms. Rutherford's Epstein Barr Virus test on November 7, 2001 suggested a recent or active infection. Dr. Mandel placed her on temporary and total disability from her usual and customary duties for twelve months.

PRUR00150



IU: claim

Name: L. a. mlu

Alan Kimelman MD  
July 12, August 2 & 23 2006  
Dawn Rutherford  
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On January 4, 2002, Physical Therapist Karen Kurtovich of Physiotherapy Associates in Rohnert Park reported that the condition was 100% worse than when she was last treated two months ago and that she presented with severe functional limitations, demonstrating loss of muscle strength, range of motion and mobility. Her dexterity was reduced to at least 50% due to redness and swelling in the joints and knuckles of her hands.

On January 8, 2002, Dr. L. Sloane Polillo of Petaluma Health Center reported treatment of Ms. Rutherford since December 20, 2001 for fibromyalgia, Epstein Barr infection, chronic fatigue syndrome, and degenerative disc disease of the cervical and lumbar spine and degenerative joint disease.

Dr. Polillo reported Ms. Rutherford was in relatively good health prior to the sudden onset of symptoms in August of 2001. She began to experience flu-like symptoms with fevers, back, neck, joint, and muscle pain and sleep disturbances with insomnia. Several physicians and specialists treated her.

Dr. Polillo noted Ms. Rutherford had been treated with several medications including two benzodiazepines, Xanax, Klonopin, two narcotic pain medications, Norco, Morphine and Soma. All the medications increase drowsiness and decreased mental clarity. The physician found Ms. Rutherford's illness caused extreme pain, reduced strength, mobility, sleep issues, and fatigue. She was unable to sit or stand for longer than 10 minutes and the only position she was able to maintain without significant pain was lying down. He found hand symptoms limited much of her dexterity. He found that Dawn Rutherford would remain fully disabled for a minimum of 12 months.

Dr. Stein on January 14, 2002 agreed with Dawn Rutherford's temporary total disability. On January 17, 2002, Dr. Jack Waxman, rheumatologist of Northern California Medical Associates in Santa Rosa, confirmed the diagnosis of fibromyalgia based on his examination of Ms. Rutherford. He also concurred with Dr. Polillo and Dr. Mandel that Ms. Rutherford was disabled at the time with the inability to perform any significant work activities for the time being. Dr. Waxman recommended ongoing muscle care to prevent progressive muscle contracture.

On January 18, 2002, Dr. Jon Sassin of North Bay Sleep Institute in Santa Rosa reported Ms. Rutherford was treated for sleep disorder initiation and maintenance related to fibromyalgia syndrome. He reported polysomnography, which indicated the presence of Alpha Intrusion on the electroencephalogram during sleep. The findings of Alpha Intrusion and reduced Stages III and IV sleep were considered highly compatible with the diagnosis of fibromyalgia syndrome in association with non-restorative sleep. He noted that the condition was partially treated with Klonopin.

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On February 6, 2002, Dr. Gary McCarthy recommended ongoing management with a fibromyalgia specialist, physical therapy and nutritional and pharmacokinetic support. He considered her 100% disabled with a guarded prognosis. Dr. McCarthy did not expect sufficient improvement to resume work within the next 12 months.

On February 12, 2002, Dr. Nancy Trahms diagnosed major depression, fibromyalgia, Epstein Barr, chronic fatigue, severe loss of health, chronic pain, possible loss of home, loss of job, and marital crisis. She was considered able to handle her own funds. She recommended antidepressants and tranquilizers would be used to control Ms. Rutherford's mood situation, which was considered a long-term issue. Dr. Trahms surmised it was not clear if and when Ms. Rutherford's fibromyalgia and severe chronic pain would remit, if possible. Dr. Trahms concluded her goal was to prevent Ms. Rutherford from committing suicide, although Dawn Rutherford and her husband cannot recall suicidal thoughts or ideation. Dawn Rutherford recalls an allergic reaction to the antidepressant medications. She received California State Disability Income.

On September 3, 2002, Dr. Yusef Erksine of Sebastopol began treating Ms. Rutherford for fibromyalgia, myofascial pain syndrome with sleep disorder, anxiety disorder and depression. Numerous somatic functions were found throughout the musculoskeletal system and a hyper sympathetic tonus in the thoracic regions and a hypoparasympathetic tonus in the cervical.

Ms. Rutherford's pain threshold was considered quite low and her anxiety level, quite high. Dr. Erksine noted in his experience, he had witnessed fibromyalgia patients respond well to osteopathic manipulative treatment. Dr. Erksine determined it would be "difficult" to achieve marked improvement through osteopathic manipulative treatment should Ms. Rutherford remain unable to control her anxiety and initiate increased sleep hygiene.

Ms. Rutherford has continued treatment with Dr. Erskine. She recounts that pain decreases for several days and then returns.

Dr. Audra Lehman of Petaluma Health Center in Petaluma assumed care of Ms. Rutherford on April 11, 2002. She noted a medical regimen of multiple medicines to decrease pain using MS Contin, Norco, Neurontin, Celebrex, Trileptal, Soma, psychiatric medications, muscle relaxers and medication for insomnia. She also received manipulation and regular hydrotherapy.

Dr. Lehman stated Ms. Rutherford's prognosis remained guarded in the 20 months since her diagnosis. Minimal progress was made toward recovery, and she was considered completely disabled and unable to work.

On September 3, 2003, Dr. Trahms stated Ms. Rutherford continued to be totally and permanently disabled. She presented with severe chronic pain and

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had difficulty driving, walking and continual issues with depression and suicidal ideation and impulses. Dawn Rutherford recalls no suicidal attempts.

Ms. Rutherford was treated twice on a weekly basis for psychotherapy and was ingesting Trileptal, Klonopin, Prozac, Neurontin, Xanax, Halcion and Seroquel. Dr. Trahms also noted that Ms. Rutherford was ingesting much pain medication prescribed by her physician. Dawn Rutherford stopped Halcion as she found it ineffective. She recalls that Prozac caused nausea and vomiting. Dr. Trahms surmised that Ms. Rutherford would remain on psychiatric treatment for the next two to five years.

On May 31, 2005, Dr. Rajina Ranadive prescribed hypercholesterolemia, ganglion and hypothyroidism. Dr. Ranadive recommended an extensive six-month diet and exercise program, self-referral to an orthopedic physician for ganglion and Levothyroxine 25 mcg daily.

On March 26, 2006, Dr. April Campbell conducted a Qualified Medical Evaluation without interviewing Ms. Rutherford. She based her information on submitted medical documents per Prudential Insurance in Philadelphia. Dr. Campbell stated functional impairments from November 12, 2003 onward was something she could not answer due to records received that were woefully lacking in a well-detailed physical exam. Statements were made about her capacity or inability to do certain things such as activities of daily living, but nowhere was there actual documentation that this had been observed. Also, the physical exams did not support, for instance, the use of a cane.

Dr. Campbell noted Ms. Rutherford used a single-point cane to ambulate, but there were no evidence in the records to indicate that she was suffering from an affliction of her lower extremities that would preclude her from walking without this device. At this point, Dr. Campbell recommended that she be referred to a physician, preferably a physical medicine and rehabilitation physician, for a complete and detailed physical exam that documented her functional abilities and also recommended that she have a functional capacity evaluation as well.

Dr. Campbell reported she was unable to determine restriction or limitation in terms of Ms. Rutherford's ability to sit, stand, reach, carry, etc. due to incomplete documentation. She stated there was not enough documentation to justify any particular restrictions or limitations on this individual.

Dr. Campbell continued, that the medical records indicated that a number of physicians considered Ms. Rutherford disabled from gainful employment. However, they did not back these statements up with any type of objective findings in their physical exams, and, in fact, in the records, most of the physical exams were incomplete.

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Dr. Campbell denoted, statements made about Ms. Rutherford's abilities or inabilities were simply not supported by any objective findings, and "it was not clear whether or not the exams were done and the objective findings were simply left out of the reports or whether full and complete physical exams were never performed on this individual. Dr. Campbell wrote that the records seemed to be a *hodgepodge, kind of crazy-quilt of information regarding this individual with no one good, detailed, extensive physical exam of this individual having been done.*

Dr. Campbell reported that, *apparently*, Ms. Rutherford actually typed up a report indicating all of her various complaints and impairments and then had the physician sign the report. At this point, Dr. Campbell noted there was insufficient evidence to support a significant impairment and stressed that it appeared that the appropriate physical exams and testing had not been performed in order to make that determination.

Dr. Campbell stated, the records indicated that Ms. Rutherford went to emergency departments at least twice with unusual symptoms that were attributed to the taking of medication. She noted Ms. Rutherford might have suffered some adverse side effects to medications on at least one occasion. On the second occasion mentioned in the records, it was noted that she overused the medications on a non-prescribed basis.

Dr. Campbell opined the diagnosis of fibromyalgia was self-reported because it was based entirely on the subjective complaints of tenderness at various points along the body. The only possible objective finding regarding the diagnosis of fibromyalgia was the sleep study that was performed that showed some alpha wave intrusion and a decrease in her stage 3 and 4 sleep.

However, these findings were not specific to fibromyalgia and could actually be found in normal individuals as well as in dysthymic, depressed individuals, and those who have experienced viral illnesses. Dr. Campbell noted she would hesitate to make the diagnosis of fibromyalgia based entirely on a sleep study. The diagnosis of chronic fatigue syndrome seemed to be based entirely on her complaints of fatigue in association with an Epstein-Barr viral antibody that indicated an acute or recent exposure to the Epstein-Barr virus.

Dr. Campbell reported while it was certainly possible that Ms. Rutherford was exposed to mononucleosis and did experience that disorder, it was however, highly unlikely that her condition at this point could be directly attributable to Epstein-Barr virus since it had been almost five years since her initial symptoms.

Dr. Campbell surmised, Ms. Rutherford's current complaints of fatigue were of any relation to that at this point and was more likely related to psychiatric issues.

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Dr. Campbell concluded, whether Ms. Rutherford was actually treated for fibromyalgia and chronic fatigue syndrome from May 1, 2001 to July 31, 2001, was not known, since the records did not herald that period of time.

### **Allergic Reaction**

Demerol caused a shaking reaction.

### **Pain Management**

Dawn Rutherford ingests two benzodiazepines, Xanax, Klonopin, two opiate pain medications, Norco, Morphine and a muscle relaxant medication Soma and Seroquel as needed for pain insomnia.

Dr. Erskine prescribes MS Contin, Norco and Soma or Carisoprodol and Morphine 60 milligrams SA.

Dr. Trahms prescribes Seroquel, Xanax, Klonopin, and Gabapentin.

Dr. Diana Prince in Rohnert Park prescribes Levothyroxine 25 mcg daily.

Dawn Rutherford has discontinued Celebrex and Trileptal. She attends no current physical therapy.

### **Current Complaints**

#### **Cervical spine**

Muscle spasm extends from the back of her head with pain in her neck and headaches. Symptoms are aggravated by activity.

#### **Speech**

Speech fluctuates from slow and labored to more fluency when she came more animated and upset during the examination.

#### **Swallowing**

She states that at times she is unable to swallow without a straw and on occasional requests her husband to hit her on the back to dislodge food. She, however, has not undergone any swallowing study.



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#### **Arms**

She states that she is unable to keyboard for any significant period of time due to pain in her hands and fingers due to pain and fatigue. She writes slowly and with special pens.

She states that she is unable to hold onto a cane due to a neuropathy in her arms. Reaching is difficult due to pain in her shoulders.

#### **Feet**

She states that she is unable to walk due to painful neuropathy in her feet. A patch of numbness with buzzing sensations is experienced along the anterior aspect of her left thigh. A feeling of unexpected pain is experienced in her anterior left anterior thigh. Neurontin has partly relieved such symptoms.

#### **Diagnostic Tests**

Although neuropathy has been diagnosed, she has undergone no nerve conduction studies or electromyographic tests to objectively assess a peripheral neuropathy or polyneuropathy.

#### **Vocational History**

Extreme clarity in communication was a qualification needed for Ms. Rutherford's position as a project manager. Her duties required simultaneous management of multiple software development projects with varying timelines, resources and requirements. Duties included leading meetings in a standing position or sitting for hours at a time without a break and intense mental concentration and focus. She was requested to travel to offices of her company in Brea where it was her responsibility to oversee all the integration of the entire line of software products, and all technical literature. She was required to interface between various groups of Quality Assurance, Engineering, Product Management and Marketing, all located in the San Rafael area and in Brea. She traveled by plane between San Rafael and Brea.

#### **Vocational Activities**

Dawn Rutherford does not perform much activities of daily living. Her husband launders, washes, dusts, and vacuums. On better days, she assists with folding laundry. She performs no shopping but on better days accompanies her husband with shopping. Dawn Rutherford's husband assisted her with donning and doffing her socks.

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She installed shower bars and purchased a shower chair after the onset of her condition. She uses these today. Although a bedroom is upstairs, on some days she will not descend the stairs at all due to her condition. She avoids driving beyond locally. Her husband works close to home and frequently returns home during the day to assist Dawn Rutherford when she is unable to climb or descend stairs to provide her food.

She uses a cane when negotiating stairs or when out of her house. She frequently leans on furniture in her house absent a cane.

She frequently drinks with a straw as her muscles spasm in her neck and she at times chokes and on occasion, when eating food and asks her husband to hit her on the back of her neck to assist with swallowing.

She states that at night she might vomit. This occurs at a frequency of about twice a week, at which times, her husband awakens, assists with cleaning and remakes the bed.

### Medical Records Reviewed

I have reviewed the records available to me and summarized the contents pertinent to the case.

**2001-2003** **Rutherford**

September 9, 2001 through September 1, 2003, correspondence from Ms. Rutherford and her husband Daniel Keegan to various physicians and insurance concerning her claim.

**August-September 2001      Leoni MD**

August 20 through September 26, 2001, Dr. James Leoni of Petaluma wrote a series of progress notes that were highly illegible. From what could be deciphered, Dr. Leoni noted Ms. Rutherford was being treated for nausea, back pain, headaches and loose stools.

**August-November 2001      Badham PhD**

August 28 through November 28, 2001 therapy notes from Psychologist Badham. The record was submitted to Ms. Annesha Pain of Prudential in Philadelphia, Pennsylvania. It was missing pages.

Psychologist Badham stated in the notes that Ms. Rutherford was basically depressed, tearful, fearful and anxious concerning issues such as an allergic

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reaction to medication that left her bedridden for a week, inability to work due to illness, fear of being homeless, discomfort in her lower back, muscle spasms, fatigue, neck issues, seeing various medical professionals and specialist and finally, difficulty in obtaining disability benefits.

In the September 27, 2001 session, Ms. Rutherford stated upon her visit with the orthopedic specialist, she was diagnosed with fibromyalgia and degenerative disc and joint conditions. She was anxious and depressed about the future.

On November 28, 2001, Psychologist Badham stated Ms. Rutherford continued to confront ongoing delays and refusal of payment from her insurance company. Ms. Rutherford continued to deteriorate.

**August 22, 2001 Meseroll MD, X-Ray**

On August 22, 2001, Dr. William Meseroll of Petaluma Valley Hospital in Petaluma interpreted an x-ray of the lumbosacral spine. His impression was lumbosacral transitional situation and no additional significant findings.

**September 14, 2001 Schulkin MD**

On September 14, 2001, Dr. Maury Schulkin of Petaluma Valley Hospital treated Ms. Rutherford for *possible medication overdose*.

Dr. Schulkin noted past medical history consisted of anxiety and low back pain. Ms. Rutherford ingested Xanax, Tylenol Codeine and occasional marijuana.

She had smoked marijuana two or three days prior to the incident.

Dr. Schulkin diagnosed her with accidental overdose of Xanax combined with Tylenol Codeine and ethanol secondary to nausea and drowsiness.

**September 18, 2001 Meseroll MD, MRI**

On September 18, 2001, Dr. Meseroll interpreted an MRI of the lumbosacral spine for the clinical history of low back pain and radicular symptoms.

Dr. Meseroll's impression was mild facet joint degenerative changes seen bilaterally from L3 through S1 and no evidence of significant disc bulging or herniation.

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**September 25, 2001 Meseroll MD, X-Ray**

On September 25, 2001, Dr. Meseroll interpreted an x-ray series of the cervical spine.

His impression was mild degenerative narrowing with marginal osteoporosis noted at the C6-C7 and mild degenerative narrowing of disc C5-C6. No significant neural foraminal encroachment or other bony lesions were identified. Dr. Meseroll also noted reversal of the normal cervical lordotic curvature might be related to spasm, spinning or positioning.

**September 25, 2001 Badham PhD**

On September 25, 2001, Psychologist Barbara Badham of Petaluma noted Ms. Rutherford had been her patient since August 28, 2001. She treated Ms. Rutherford twice per week for acute anxiety and depression. As of date, Psychologist Badham noted seven sessions thus far.

Psychologist Badham stated the combination of physical demands at 10-12 hours per day, exceptionally high level of stress and instability in the field of technology were all demonstrated by the fact that Ms. Rutherford had been laid off six times since 1999 through no fault of her own thus contributing to her acute anxiety and depression.

Psychologist Badham surmised, it was her determination that Ms. Rutherford was not qualified to return to a career in technology.

She proposed Ms. Rutherford receive occupational rehabilitation to obtain alternative employment opportunity.

**September 26, 2001 Kurtz MD**

On September 26, 2001, Dr. Michael Kurtz of San Rafael wrote a progress note that was highly undecipherable.

In a duty status report, Dr. Kurtz wrote that Ms. Rutherford was diagnosed with cervical and lumbosacral degenerative disc disease, degenerative joint disease and fibromyalgia. She was to remain off work effective the day of appointment through October 11, 2001.

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**October 11, 2001**

**Illegible PT**

On October 11, 2001, an unidentified physical therapist from Physiotherapy Rohnert Park completed a handwritten initial evaluation on the back. The seven-page evaluation was completely illegible.

**October 11, 2001**

**Kurtz MD**

On October 11, 2001, Dr. Kurtz noted in a duty status report that Ms. Rutherford was to remain off work from October 11, 2001 through December 3, 2001.

**October 16, 2001**

**Illegible PT**

On October 16, 2001, an unidentified physical therapist from Physiotherapy Rohnert Park completed a progress note indicating this was Ms. Rutherford's third visit. The rest of the notes were illegible. From what could be deciphered, the therapist noted neck, mid low back pain, sciatic pain, numbness in the right leg, headaches, fatigue and pain in the left foot.

This was not considered job-related but was considered a chronic illness. Ms. Rutherford had remained off work since August 31, 2001.

**October-December 2001 Grinnel FNP**

October 19, 2001 through December 5, 2001, Family Nurse Practitioner Patricia Grinnell of Petaluma wrote a series of handwritten progress notes concerning Ms. Rutherford's diagnoses of fibromyalgia, degenerative disc disease of the cervical and insomnia.

**November 1, 2001**

**Badham PhD**

On November 1, 2001, Psychologist Badham wrote a letter concerning questions regarding the purpose of her counseling sessions with Ms. Rutherford.

Psychologist Badham stated she want to clarify that Ms. Rutherford was not at the time seeking vocational rehabilitation due to her disabilities from fibromyalgia, cervical and lumbosacral degenerative disc disease, degenerative joint disease and chronic fatigue syndrome.

Psychologist Badham stated since the diagnoses, the focus of the sessions were on Ms. Rutherford's significant anxiety and depression regarding her condition.

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Psychologist Badham said the session notes she provided documented the difficulties and challenges in obtaining quality medical care for her disabilities. Therefore, Ms. Rutherford was not capable of participating in any type of vocational rehabilitation at the time due to the physical limitations of her ongoing disability and her concomitant psychological condition.

**November 13, 2001 Mandel MD**

On November 13, 2001, Dr. Jeffrey Mandel of Hayward had first diagnosed Ms. Rutherford on October 24, 2001 for fibromyalgia and chronic fatigue syndrome.

He stated when upon Ms. Rutherford's first office visit, she stated she experienced fatigue accompanied by numerous other painful syndromes starting in August of 2001.

Dr. Mandel reported at the time of diagnosis, he was unaware of strict criteria for the diagnosis of chronic fatigue syndrome as being six previous months of notable fatigue. He concluded that since Ms. Rutherford was examined on October 24, 2001, it was his opinion that she was experiencing the onset of chronic fatigue syndrome.

**November 19, 2001 Mandel MD**

On November 19, 2001, Dr. Mandel wrote a list of symptoms detailing all Ms. Rutherford's issues of disability. This was the same exact report as Dr. Kurtz's (prepared by Dawn Rutherford), dated December 3, 2001.

**November 28, 2001 Mandel MD**

On November 28, 2001, Dr. Mandel stated Ms. Rutherford's overall health had not improved. She continued to experience daily pain upon awakening. Ms. Rutherford indicated pain particularly in the lower lumbar, cervical and head areas, which greatly inhibited her ability to function normally throughout the day.

**November 30, 2001 Mandel MD**

On November 30, 2001, Ms. Rutherford was re-evaluated as having probable pre-existing condition after receiving disability benefits from Prudential for the past three months.

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Dr. Mandel stated upon learning about Ms. Rutherford's dilemma, his office contacted the Center for Disease Control to inquire further diagnosis criteria for fibromyalgia.

Dr. Mandel stated Ms. Kathleen Stewart in Health Care Quality reviewed the CDC Online Database and confirmed that the CDC did not have standardized diagnosis criteria regarding the onset of fibromyalgia.

Dr. Mandel reported he specialized in the treatment of fibromyalgia and in his years of practice, observed that no two patients ever experienced the same onset of the disease. Some patients experienced sudden onset and become disabled in a matter of weeks whereas other patients experienced milder symptoms, which might not result in instant disabling condition.

Dr. Mandel concluded it was his understanding that Ms. Rutherford provided her insurance with various medical records indicating she had no prior illnesses or prescription for the year of 2001. Thus, proving her fibromyalgia was not a pre-existing condition.

**December 3, 2001**

**Kurtz MD/Rutherford**

On December 3, 2001, Ms. Rutherford prepared a letter concerning suspicion of pre-existing condition prior to Dr. Kurtz's diagnosis of fibromyalgia, lumbosacral disease and degenerative disease on September 26, 2001. Dr. Kurtz stated, *The above the letter was prepared by Dawn Rutherford. I agree with its content.* He signed the letter.

Dr. Kurtz documented that Ms. Rutherford had provided her insurance carrier, Prudential extensive insurance and pharmacy records that she did not even visit a physician or require prescription medications in the 12 months prior to the onset of illness, August 2001.

**December 3, 2001**

**Grinnel FNP**

On December 3, 2001, Nurse Grinnel wrote a letter to correct an error on the chart notes of Ms. Rutherford dated October 19, 2001 from the offices of Dr. Park and Dr. Finzen.

**December 13, 2001**

**Sassin MD**

On December 13, 2001, Dr. Jon Sassin of North Bay Sleep Medicine Institute in Santa Rosa conducted a polysomnographic report. His impression was alpha intrusion and medication effect with no evidence of sleep apnea or limb movement on the recording.

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**December 17, 2001 Kurtz MD**

On December 17, 2001, Dr. Kurtz documented that he examined Ms. Rutherford for her ongoing disability conditions of fibromyalgia, degenerative joint disease and degenerative cervical and lumbosacral disc disease.

**December 17, 2001 Kurtz MD**

On December 17, 2001, Dr. Kurtz wrote a prescription for functional residual capacity testing at the Asher Clinic in Larkspur upon the advice from Ms. Rutherford that her insurance carrier requested it.

**December 20, 2001 Mandel MD**

On December 20, 2001, Dr. Mandel noted Ms. Rutherford received an Epstein Barr Virus test on November 7, 2001. The laboratory result suggested "recent or active infection. Anti-EA becomes undetectable weeks to months after onset."

Dr. Mandel continued with a three-page summary on fibromyalgia.

The rest of the report was missing.

**January 2, 2002 Illegible PT**

On January 2, 2001, an unidentified physical therapist from Physiotherapy Rohnert Park wrote a handwritten initial back evaluation. The seven-page evaluation was completely illegible. The four-page evaluation was illegible.

**January 4, 2002 Kurtovich PT**

Physical Therapist Karen Kurtovich of Physiotherapy Associates in Rohnert Park wrote a report of Ms. Rutherford's progress.

**January 8, 2002 Polillo MD**

On January 8, 2002, Dr. L. Sloane Polillo of Petaluma Health Center wrote a note to provide documentation of Ms. Rutherford's disability.

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**January 14, 2002**

**Stein MD**

On January 14, 2002, Dr. Peter Stein, rheumatologist from Greenbrae stated Ms. Rutherford continued to present with severe pain, fatigue and sleep disorder caused by fibromyalgia. Dr. Stein opined that she was not capable of work and deserved disability status for at least the next six months. At the moment, her disability was considered too severe to perform well enough to satisfy an employer. He surmised that, should Ms. Rutherford ever improve, part-time work would suffice.

**January 14, 2002**

**Badham PhD**

On January 14, 2002, Psychologist Badham stated she concurred with the other health care providers who supported total disability and that it would last 12 additional months and would become permanent based on her response to treatment and possible complications.

**January 17, 2002**

**Waxman MD**

On January 17, 2002, Dr. Jack Waxman, rheumatologist of Northern California Medical Associates in Santa Rosa, confirmed the diagnosis of fibromyalgia based on his examination of Ms. Rutherford.

He also concurred with Dr. Polillo and Dr. Mandel that Ms. Rutherford was disabled at the time with the inability to perform any significant work activities for the time being.

Dr. Waxman recommended ongoing muscle care to prevent progressive muscle contracture.

**January 18, 2002**

**Sassin MD**

On January 18, 2002, Dr. Jon Sassin of North Bay Sleep Institute in Santa Rosa reported Ms. Rutherford was treated for sleep disorder initiation and maintenance related to fibromyalgia syndrome.

**February 6, 2002**

**McCarthy MD**

On February 6, 2002, Dr. Gary McCarthy of Santa Rosa treated Ms. Rutherford for the impression of status post viral infection with ongoing fibromyalgia.

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**February 12, 2002**

**Trahms MD**

On February 12, 2002, Dr. Trahms reported that Ms. Rutherford had been exposed to Epstein Barr and developed flu-like illness with nausea, vomiting, and diarrhea and generalized joint and muscle pain. She became literally bedridden and eventually could not continue work. Ms. Rutherford developed chronic fatigue and pain. She could not perform house duties, continually dropped objects, and was barely able to get dressed. She essentially became anxious, fearful and depressed.

**March 8, 2002**

**Trahms MD**

On March 8, 2002, Dr. Trahms stated Ms. Rutherford continued to be ill with severe panic attacks, agoraphobia, depression and anxiety.

She anticipated disability that would last at least a year, or possibly three to four years with the likelihood of permanency.

Dr. Trahms noted Ms. Rutherford was extremely anxious and might require hospitalization if she was not seen on a weekly basis.

**April 16, 2002**

**Gerson MD**

On April 16, 2002, Dr. Stephen Gerson of Lexington, Massachusetts wrote in his eight-page case summary report that Ms. Rutherford's work absence was not related to illness. On August 23, 2001, an employee statement was filed indicating her illness was extreme fatigue, nausea, headaches, lower back pain, and feverishness, muscle and joint pains. She had not filed a Workers' Compensation claim though she received state disability benefit of \$336.00 per week.

Dr. Gerson noted a physician statement from Dr. John Leoni, dated August 26, 2001, (which I have no record of) indicated Ms. Rutherford stopped working on August 1, 2001 though the reason was unexplained. Dr. Gerson reported this was not an on-the-job injury and that she no prior history.

Other medical history noted headaches and migraines dating back to 1989.

**April 23, 2002**

**Gerson MD**

On April 23, 2002, Dr. Gerson reported that Dr. Trahms stated in a report that Ms. Rutherford was exposed to Epstein Barr Syndrome while on a camping trip at Yosemite National Park. (I have no record of this account)

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**August 1, 2002****Trahms MD**

On August 1, 2002, Dr. Trahms reported Ms. Rutherford was deemed totally disabled and was in the process of attempting rehabilitation.

**September 3, 2002****Erksine DO**

On September 3, 2002, Dr. Yusef Erksine of Sebastopol reported Ms. Rutherford was under his care for osteopathic manipulative treatment.

**April 23, 2003****Lehman MD**

On April 23, 2003, Dr. Audra Lehman of Petaluma Health Center in Petaluma assumed care of Ms. Rutherford.

**September 3, 2003****Trahms MD**

On September 3, 2003, Dr. Trahms stated Ms. Rutherford continued to be totally and permanently disabled. She presented with severe chronic pain and had difficulty driving, walking and continual issues with depression and suicidal ideation and impulses.

**July 15, 2004****Trahms MD**

On July 15, 2004, Dr. Trahms reported Ms. Rutherford's mental and physical issues remained unchanged. She also noted chronic pain and a heavy dose of morphine kept her bedridden for two to three days a week.

**May 31, 2005****Ranadive MD**

On May 31, 2005, Dr. Rajina Ranadive of an unidentified medical facility assessed Ms. Rutherford with hypercholesterolemia, ganglion and hypothyroidism.

**March 26, 2006****Campbell MD**

On March 26, 2006, Dr. April Campbell of reviewed the medical records. She based her information on submitted medical documents per Prudential Insurance in Philadelphia, and responded to questions at the request of Mr. James Furman of Prudential Insurance.

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**April 13, 2006****Insurance SOAP Notes**

April 13, 2006, four-page SOAP notes considering the history of Ms. Rutherford's illness.

**Examination****General**

The evaluation was frequently stopped to ally Dawn Rutherford's anxiety, and to discuss her prolonged history and multiple pain complaints.

**Appearance**

Dawn Rutherford was well groomed and wore makeup. She did not shake hands. She did not button or zip clothes, and had her husband perform all functions of donning or doffing clothes. She relied on her husband to open and close the door of the exam room.

**Sitting**

Dawn Rutherford could not tolerate sitting on an examination table or a standard chair and frequently fidgeted and grimaced. Sitting on a cushioned chair reduced these symptoms. She stood using a cane or with assistance from her husband.

When sitting, her hips and knees tolerated 90 degrees of range, although such could not be measured when supine.

Whenever she needed to change postures, her husband assisted. She frequently interrupted the examination to talk about her pain, complain of the severity of pain, or breathe audibly.

**Gait**

Gait fluctuated between a wide-based gait when holding onto her husband to a slow labored gait associated with heavy breathing.

When not asked to perform various examination maneuvers, Dawn Rutherford fidgeted little and moved little. She generally held her body immobile. When wiping her face, she moved with no spasticity or hesitation in her wrists or forearms. Although she complained of pain when walking and held

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onto her hand, she exhibited a shuffling type gait with heel strike but absent significant toe push off. No loss of balance or muscle spasm was noted.

| Activity              | Right  | Left                    |
|-----------------------|--|-------------------------|
| Level terrain         | Slow and guarded, absent significant heel strike and loss of balance absent a cane or holding onto her husband.    |                         |
| Tandem gait           |  | Unable                  |
| Toe walking           | Apprehensive of pain and expressing increased symptoms of anxiety  |                         |
| Heel walking          | Normal   | Normal                  |
| Balancing on one leg  |  | Apprehensive of falling |
| Squatting             | Apprehensive of falling, showing one half range of motion, while expressing pain complaints in her back and knees. |                         |
| Rising from squat     | Normal   | Normal                  |
| Mounting exam table   | Slow and cautious, assisted by her husband with frequent complaints of pain, mild profanity.                       |                         |
| Sitting on exam table | Normal, without weight bearing on arms   |                         |
| Hopping               | Apprehensive of falling  |                         |
| Removing shoes        | Husband assisted   |                         |
| Assistive device      | At times, a cane   |                         |
| Romberg               | Minimal loss of balance; increased heavy breathing and expressions of anxiety                                      |                         |

### Temporal Mandibular

Temporal mandibular joint excursion was intact for talking and drinking from a cup of water. Significant tenderness to palpation was expressed with palpation of the temporal mandibular joints. No dislocation of the temporal mandibular joint was found.

### Cervical Spine

Range of motion was performed accompanied by pain complaints, with hesitation and jerking movements. Instructions were repeated several times at the request of Dawn Rutherford.

| Vector          | Right | Sag | Left | Normal |
|-----------------|-------|-----|------|--------|
| Flexion         |       |     |      |        |
| Calvarium Angle | 30    | 30  | 30   |        |
| T1 ROM          | 10    | 10  | 10   |        |
| Flexion Angle   | 20    | 20  | 20   | 50     |

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| Vector           | Right |    |    | Sag |    |    | Left |    |    | Normal |
|------------------|-------|----|----|-----|----|----|------|----|----|--------|
| Extension        |       |    |    |     |    |    |      |    |    |        |
| Calvarium Angle  |       |    |    | 10  | 10 | 10 |      |    |    |        |
| T1 ROM           |       |    |    | 5   | 5  | 5  |      |    |    |        |
| Extension Angle  |       |    |    | 5   | 5  | 5  |      |    |    | 60     |
| Lateral Bending  |       |    |    |     |    |    |      |    |    |        |
| Calvarium Angle  | 30    | 30 | 30 |     |    |    | 30   | 30 | 30 |        |
| T1 ROM           | 15    | 10 | 15 |     |    |    | 10   | 15 | 10 |        |
| Lat. Bend. Angle | 15    | 20 | 15 |     |    |    | 20   | 15 | 20 | 45     |
| Rotation         | 20    | 20 | 20 |     |    |    | 20   | 20 | 20 | 80     |

### Thoracic Spine

Tenderness to palpation was noted at the cervicothoracic junction. Tenderness to palpation was expressed in the mid thoracic spine around T8 through T10 and along the upper thoracic spine along T4.

| Vector            | Right |    |    | Sag |     |    | Left |    |    | Normal |
|-------------------|-------|----|----|-----|-----|----|------|----|----|--------|
| Flexion           |       |    |    |     |     |    |      |    |    |        |
| T1 ROM            |       |    |    | 40  | 40  | 40 |      |    |    |        |
| T12 ROM           |       |    |    | 10  | 10  | 10 |      |    |    |        |
| Flexion Angle     |       |    |    | 30  | 30  | 30 |      |    |    | 50     |
| Rotation (Supine) |       |    |    |     |     |    |      |    |    |        |
| T1 ROM            | 20    | 20 | 20 |     |     |    | 30   | 30 | 30 |        |
| T12 ROM           | 5     | 5  | 5  |     |     |    | 5    | 5  | 5  |        |
| Rotation Angle    | 15    | 15 | 15 |     |     |    | 25   | 25 | 25 | 30     |
| Min. Kyphosis     |       |    |    |     |     |    |      |    |    |        |
| T1 Reading        |       |    |    |     | 10  |    |      |    |    |        |
| T12 Reading       |       |    |    |     | -10 |    |      |    |    |        |
| Min K. Angle      |       |    |    |     | 20  |    |      |    |    | <60    |

Permanent Impairment, 5th Edition, section 15.10c, page 415 was employed, using an inclinometer across the manubrium. Because this angle actually measures thoracolumbar rotation, 5° rotation (the average lumbar rotation) is subtracted from the measurement to obtain the estimated thoracic rotation.

### Shoulder

Significant complaints of pain were expressed with range of motion. The examination required an extended amount of time. Grimacing, squinting and crying punctuated the examination. Instructions had to be repeated several

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times. Internal rotation when demonstrating other sites of pain showed better excursion than during the formal examination.

| Vector                        | Right | Left | Normal |
|-------------------------------|-------|------|--------|
| Flexion when upright          | 90    | 90   | 180    |
| Flexion when supine           | 60    | 40   | 180    |
| Extension                     | 10    | 50   | 50     |
| Adduction                     | 30    | 15   | 40     |
| Abduction when upright        | 110   | 70   | 170    |
| Internal Rotation             | 40    | 50   | 80     |
| External Rotation             | 60    | 60   | 90     |
| External Rotation when supine | 30    | 30   | 90     |

#### Elbow

Movement was at times jerky and slow. Instructions were repeated several times as she stated that she did not understand the instructions for range of motion. Despite pain in the elbows, no swelling or abnormality was detected in these joints.

| Vector     | Right | Left | Normal |
|------------|-------|------|--------|
| Flexion    | 120   | 120  | 140    |
| Extension  | 0     | 0    | 0      |
| Pronation  | 80    | 80   | 80     |
| Supination | 60    | 60   | 70     |

#### Wrist

Movement on the formal examination appeared less than on the informal examination. Pain was expressed with range of motion. The examination was interrupted by deep breathing, complaints of pain in the wrist and thumbs, and frequent crying. Instructions were repeated several times at the request of Dawn Rutherford.

| Vector           | Right | Left | Normal |
|------------------|-------|------|--------|
| Flexion          | 40    | 40   | 60     |
| Extension        | 30    | 10   | 60     |
| Radial Deviation | 20    | 20   | 20     |



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| Vector          | Right | Left | Normal |
|-----------------|-------|------|--------|
| Ulnar Deviation | 10    | 20   | 30     |

#### Thumb

| Vector            | Right  | Left   | Normal |
|-------------------|--------|--------|--------|
| IP Flexion (deg)  | 50     | 50     | 80     |
| MP Flexion (deg)  | 40     | 40     | 60     |
| CMC Rad Abd (deg) | 50     | 50     | 50     |
| CMC Add (cm)      | 3      | 3      | 0      |
| CMC Opp (cm)      | 4      | 5      | 8      |
| CMC Grinding      | Absent | Absent | Absent |

#### Fingers

Finger flexion into a fist was slow with the distal fingertips missing the palmar creases by one centimeter. No focal loss of range of motion was noted in the interphalangeal joints.

#### Dexterity

Dexterity was intact for handling her handkerchief, removing shoes, and opening the door.

#### Abdomen

Perception of a 10-gram monofilament was reduced throughout the abdomen.

#### Lumbar Spine

Moderate tenderness to palpation was expressed with palpation although no significant muscle spasm was noted. Palpation of the lumbar spine and sacrum provoked low grade screaming and some mumbled profanity.

Straight leg raising varied between 20 degrees and 40 degrees noted on two different examination dates.

Range of motion provoked pain complaints in the sacroiliac joints.

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| Vector                      | Right |    |    | Sag |    |    | Left |    |    | Normal  |       |
|-----------------------------|-------|----|----|-----|----|----|------|----|----|---|-------|
| Flexion                     |       |    |    |     |    |    |      |    |    |   |       |
| T12 ROM                     |       |    |    | 20  | 20 | 20 |      |    |    | 105   |       |
| Sacral ROM                  |       |    |    | 0   | 0  | 0  |      |    |    | 45  |       |
| Flexion Angle               |       |    |    | 20  | 20 | 20 |      |    |    | 60  |       |
| Extension                   |       |    |    |     |    |    |      |    |    |   |       |
| T12 ROM                     |       |    |    | 15  | 10 | 15 |      |    |    |   |       |
| Sacral ROM                  |       |    |    | 0   | 0  | 0  |      |    |    |   |       |
| Extension Angle             |       |    |    | 10  | 10 | 10 |      |    |    | 25  |       |
| Lateral Bending             |       |    |    |     |    |    |      |    |    |   |       |
| T12 ROM                     | 20    | 10 | 10 |     |    |    | 10   | 20 | 10 |   |       |
| Sacral ROM                  | 0     | 0  | 0  |     |    |    | 0    | 0  | 0  |   |       |
| Lat. Bend Angle             | 20    | 10 | 10 |     |    |    | 10   | 20 | 20 | 25  |       |
| Seated Straight Leg Raising | 50    | 50 | 50 |     |    |    | 50   | 50 | 50 | 55  |       |
| Supine Straight Leg Raising | 40    | 40 | 35 |     |    |    | 40   | 40 | 35 | 55  |       |
| Validity Test*              |       |    |    |     |    |    |      |    |    | Invalid Measurement of Sagittal Flexion and Extension | Valid |

As recommended in the AMA Guides, 5th Edition, section 15.8, pages 399-401, two mechanical inclinometers were employed to simultaneously measure the motion of both the upper and lower extremes of the spine motion segment being examined. Measurement points were clearly indicated and motion testing was conducted up to six times to obtain three consecutive measurements that meet consistency requirements.

Page 406, Item 6, American Medical Association Guides to the Evaluation of Permanent Impairment, 5<sup>th</sup> edition.

An accessory validity test can be performed for lumbar sacral flexion and extension. In this test, record the straight leg raising angle of the supine individual by placing an inclinometer on each tibial spine with the knees in extension and hips flexed. Compare the straight leg raising angle to the sum of the sacral flexion and extension (sacral or hip motion) angles. If the straight leg raising exceeds the sum of sacral flexion extension angle by more than 15 degrees, then lumbar sacral flexion test is invalid.

Normally the straight leg raising angle is about the same as the sum of sacral flexion and extension angle. If the individual resists passive straight leg raising without other evidence of radiculopathy, the accessory test is also invalid. If invalid, the examiner should either repeat the flexion extension test or disallow impairment of lumbar sacral spine flexion and extension. This validity test is useful only when sacral flexion plus extension is less than the average for normal individuals (i.e., 65° for women and 55° for men).

At these levels or above, the difference between sacral motion and supine straight leg raising will usually exceed 15 degrees because the hamstring and gluteal muscles are contracted in the standing flexed posture and relaxed in the supine position. Below the threshold of 65° for women and 55° for men, the tightest supine straight leg raising angle should not be more than 15 degree greater than the combined sacral hip flexion and extension angle in the standing position.

## Pelvis

The sacroiliac joints exhibited moderate tenderness to palpation.

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### Hips

Pain was expressed with range of motion. Full hip range of motion could not be performed due to pain complaints. Tenderness was expressed throughout.

| Direction         | Right | Left | Normal |
|-------------------|-------|------|--------|
| Extension         | 30    | 30   | 30     |
| Flexion           | 20    | 20   | 110    |
| Abduction         | 50    | 50   | 50     |
| Adduction         | 30    | 30   | 30     |
| Internal Rotation | 35    | 35   | 35     |
| External Rotation | 50    | 50   | 50     |

### Knees

When supine, range of motion was significantly more limited than the 90 degrees exhibited when sitting. Full knee range of motion was exlinited. As tenderness to palpation was expressed along all aspects of the knee, and as Dawn Rutherford tolerated only 45 degrees of knee flexion, McMurray and Lachman's were not evaluated. Nonetheless, no effusion was noted.

| Direction                | Right | Left | Normal |
|--------------------------|-------|------|--------|
| Extension                | 0     | 0    | 0      |
| Flexion                  | 45    | 45   | 135    |
| Lateral Joint Tenderness | None  | None | None   |
| Medial Joint Tenderness  | None  | None | None   |
| Effusion                 | None  | None | None   |
| McMurray's               | None  | None | None   |
| Lachman's                | None  | None | None   |
| ACL Instability          | None  | None | None   |
| Calves (cms)             | 39    | 39   |        |

### Ankles

Pain was expressed with all parts of the examination.

| Direction                | Right | Left | Normal |
|--------------------------|-------|------|--------|
| Dorsiflexion             | 5     | 5    | 15     |
| Plantar Flexion          | 45    | 45   | 50     |
| Lat Malleolar Tenderness | None  | None | None   |
| Med Malleolar Tenderness | None  | None | None   |

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| Direction                | Right  | Left   | Normal |
|--------------------------|--------|--------|--------|
| Achilles Tendon Swelling | Absent | Absent | Absent |
| Subtalar Joint           | Normal | Normal | Normal |
| Creptus                  | None   | None   | None   |

### Neurological Examination

#### Cognitive Evaluation

|   |        |
|---|--------|
| Orientation to person                               | Intact |
| Orientation to place                                | Intact |
| Orientation to time                                 | Intact |
| Recollection of activities prior to the examination | Intact |
| Reliability of findings                             | Good   |

#### Communication

No expressive or receptive aphasia was noted, although Dawn Rutherford stuttered and squeezed her eyes shut intermittently during the examination.

#### Cerebellar

Finger to nose and dexterity revealed no impairment.

#### Cranial Nerves

| No.     | Cranial nerve function   |
|---------|--|
| 2       | Visual fields were intact. Pupils responded to light and accommodation.  |
| 3, 4, 6 | Extra-ocular muscles were intact.  |
| 5       | Normal strength was noted in muscles of mastication and normal sensation was noted in the descending bulbar thalamic tracts. |
| 7       | Normal strength was noted in muscles of facial expression.   |
| 8       | Normal auditory acuity was noted bilaterally.  |
| 9 & 10  | Normal function was noted in bulbar muscles of swallowing and phonation.   |
| 11      | Normal accessory muscle strength was noted bilaterally.  |

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12 Normal lingual muscle strength was noted.  
**Strength**

Manual muscle testing was not reliable as Dawn Rutherford expressed pain with testing. When resisted, she exhibited cogwheeling, or breakaway weakness. Nonetheless, a minimal of anti-gravity strength of 4/5 was present in all muscle groups for weight bearing activities such as assisting with weight bearing activities on the arms and sliding to the foot of the examination table to dismount and on the lower extremities when walking.

**Jamar**

| Pounds Per Square Inch       | Right | Left |
|------------------------------|-------|------|
| Major upper extremity        | •     |      |
| First Grip                   | 6     | 3    |
| Second Attempt               | 6     | 3    |
| Third Attempt                | 3     | 3    |
| Average Grip                 | 5     | 3    |
| Maximal effort exerted       | ?     | ?    |
| Expected AMA Value           | 51    | 47   |
| Percent of Expected Value    | 10%   | 6%   |
| Index of lost grip strength* | 90%   | 94%  |

Expected grip strength according to the American Medical Association guidelines for females ages 40 to 49 years equals 23.4 and 21.5 kilograms or 51 pounds in the dominant and 47 pounds in the non-dominant hand (American Medical Association *Guides to the Evaluation of Permanent Impairment*, Fifth edition, Table 16-32, page 509).

\*The index loss of grip strength is calculated by subtracting the average of the measured Jamar grip strengths from the expected American Medical Association's average for age and gender and dividing the difference by the expected value. A positive index of lost grip strength indicates that grip strength is lower than the expected averages. A negative index indicates that the measured grip strength is a negative loss or, in other words, exceeds the expected average.

Dawn Rutherford's average grip strength in the major right upper extremity as measured after repetitive attempts measured five pounds and calculated to 10% of the American Medical Association's expected averages for gender and age. As such, it represents an index grip strength loss of 90%.

Average grip strength in the minor left upper extremity as measured after repetitive attempts measured three pounds and calculated to 6% of the American



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Medical Association's expected averages for gender and age. As such, it represents an index grip strength loss of 94%.

The above grip strengths were not consistent with Dawn Rutherford's ability to hold onto her husband's arm with her left hand and hold a cane with her right as more than three pounds of grip force with the left arm is indicated to hold the weight of the upper extremity as well as hold the body from falling. Six pounds of force is adamant to assist in holding a cane against a falling body.

### Sensitivity to Touch in Fingers

Perception of a 10-gram monofilament was intact in all five fingers in both hands. Such perception of the same 10-gram monofilament was experienced as pressure on both shoulders, both forearms and the dorsum of both hands.

Although an extended amount of time was spent in sensory examination, the perception of two-point discrimination fluctuated as much as a variance between 3 and 8 millimeters, an unusual variance. Nonetheless, the best point discrimination in millimeter measured:

|                   | Thumb |   | Index |   | Middle |   | Ring |   | Little |   |        |
|-------------------|-------|---|-------|---|--------|---|------|---|--------|---|--------|
| Sensory Loss (mm) | R     | L | R     | L | R      | L | R    | L | R      | L | Normal |
| Transverse (both) | 3     | 3 | 3     | 3 | 6      | 4 | 6    | 5 | 8      | 5 | ≤6 mm  |

### Sensitivity to Touch in Arms

Perception of a 10-gram monofilament exhibited the following levels of sensation based upon the *AMA Guides to the Evaluation of Permanent Impairment*, 5<sup>th</sup> edition, Table 16-10, page 482. She refused pinprick testing.

| Nerve Distribution | Right | Left | Normal |
|--------------------|-------|------|--------|
| C5                 | 4     | 4    | 5      |
| C6                 | 4     | 4    | 5      |
| C7                 | 5     | 5    | 5      |
| C8                 | 5     | 5    | 5      |

### Sensitivity to Touch in Legs

Perception of a 10-gram monofilament was reduced throughout the abdomen and throughout the legs, more in the lateral thighs and feet but without regard for dermatomal distribution. Dawn Rutherford refused pinprick testing.

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**Reflexes**

| Reflex        | Right | Left | Normal |
|---------------|-------|------|--------|
| Biceps        | 2     | 2    | 2/4    |
| Triceps       | 2     | 2    | 2/4    |
| Quadriceps    | 3     | 3    | 2/4    |
| Triceps Surae | 2     | 2    | 2/4    |
| Plantar       | 0     | 0    | 0      |

**Muscle Atrophy**

|                | Right | Left |
|----------------|-------|------|
| Hand Intrinsic | None  | None |
| Foot Intrinsic | None  | None |

**Fibromyalgia Screen**

| Region   | Right | Left |
|--|-------|------|
| Suboccipital muscle insertions                           | 1     | 1    |
| Low cervical (anterior aspects of spaces at C6-C7)       | 1     | 1    |
| Trapezius (midpt. upper border)                          | 1     | 1    |
| Supraspinatus (above scapula spine near medial border)   | 1     | 1    |
| Second costochondral junctions                           | 1     | 1    |
| Distal to lateral epicondyles                            | 1     | 1    |
| Gluteals (upper outer quadrants of buttocks)             | 1     | 1    |
| Great trochanters (posterior to trochanteric prominence) | 1     | 1    |
| Knees (medial fat pad proximal to joint line)            | 1     | 1    |
| Total  | 9     | 9    |

Dawn Rutherford's total number of positive fibromyalgia sites are 18 out of a possible 18 with 11 as the threshold for positive identification of fibromyalgia.

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### Validity Indicators

#### Magnuson's test

Magnuson's test is defined as non-reproducible localization of tenderness in the neck or low back. If pain moves to various sites during the examination, it is non-anatomic pain.

In regard to Dawn Rutherford, she expressed pain in nearly every area touched in her neck and back. As such, determining the movement of pain was not possible in the neck or back as all sites were painful.

#### Waddell signs for identifying non-organic causes of back

| Sign                                | Positive finding                                    | Status | Notes                   |
|-------------------------------------|---|--------|-------------------------|
| Superficial tenderness <sup>1</sup> | Skin discomfort on palpation                        | 1      |                         |
| Nonanatomic tenderness <sup>2</sup> | Tenderness that crosses multiple somatic boundaries | 1      |                         |
| Axial loading <sup>3</sup>          | Report of low back pain                             | 0      | Complained of neck pain |

<sup>1</sup> Superficial tenderness Physical back pain does not make the skin tender to light touch. Pain (the subjective complaint) and tenderness (discomfort on palpation) should not have sharp demarcations at the body's midline. Therefore, superficial tenderness is a positive behavioral sign. It is almost always present in patients motivated by financial secondary gain and almost never in patients with well-demonstrated physical pathologic conditions that improve appropriately.

<sup>2</sup> Nonanatomic tenderness Physical pain usually localizes to a specific skeletal or neuromuscular structure. Tenderness that crosses multiple somatic boundaries (e.g. thoracic back pain that extends out over the scapula, trapezial pain involving the clavicle) rarely has a physical cause. Any pain or tenderness that crosses anatomic lines without a reasonable explanation is considered a positive Waddell sign.

Magnuson's test is defined as non reproducible localization of tenderness in the neck or low back. If pain moves to various sites during the examination, it is non-anatomic pain.

<sup>3</sup> Axial loading. Axial loading involves pressing down on the top of the head of a standing patient. This maneuver should not produce low back pain. If pain is reported, it is a behavioral sign. Waddell and associates (3) suggested disregarding any reported neck pain, because a few patients with physiologic pain do have neck pain with axial loading.

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| Sign                                       | Positive finding   | Status | Notes |
|--|--|--------|-------|
| Simulated rotation <sup>4</sup>            | Report of back pain  | 1      |       |
| Distracted straight-leg raise <sup>5</sup> | Report of pain in low back or posterior thigh; lessening of pain with continued leg raising; severe pain at 10° flexion in patient with no apparent disability | 1      |       |
| Regional sensory change <sup>6</sup>       | "Stocking" or global distribution of numbness  | 1      |       |

<sup>4</sup> Simulated rotation Simulated rotation is a simple test performed in a standing patient. When the shoulders and pelvis are rotated in unison, the structures in the back are not stressed. If the patient reports back pain with this rotation, the test is considered positive for a non-organic source of the patient's complaints.

<sup>5</sup> Distracted straight-leg raise In the standard straight-leg raise test, the patient is recumbent and aware of the test being performed. In contrast, a distracted straight-leg raise test is performed anytime the hip is flexed with the knee straight. This position occurs naturally during lumbar range-of-motion testing when the patient is bent forward. The distracted straight-leg raise test also can be done by examining the foot with the patient seated with one knee extended (ie, during Babinski or reflex testing, inspection of the sole of the foot, sensory testing, motor strength testing, and checking for pulses). Patients with organic pain have the same results on both the standard straight-leg raise and the distracted straight-leg raise test.

The standard straight-leg raise test works because the sciatic nerve runs behind the axis of rotation of the hip. When the hip is flexed, the nerve must "stretch." Up to 1.5 in. of nerve root slides in and out of the exit foramina of the spine during this maneuver. When the knee is flexed, the nerve remains lax, and no stretching or sliding of the nerve root occurs. The test is considered positive when pain is produced along a dermatome (ie, L4-medial calf, L5-lateral calf, S1-lateral foot) below the knee. Pain in the low back is not a feature of a positive test. Posterior thigh pain also is not a classic positive sign but may be seen in patients with mild sciatica.

During a standard straight-leg raise, applying dorsiflexion to the foot (Slip test) further stretches the nerve and heightens the pain. A reverse Slip test involving plantar flexion of the foot should lessen the pain. When it does not, the test is considered positive for a behavioral source of pain.

In patients with organic pain, continuing to raise the leg after the pain first starts is extremely painful. In behaviorally motivated patients, however, further stretching is often easy and does not significantly increase their distress. When questioned, some patients motivated by secondary gain may report that the pain lessens with further raising of the leg. Another incongruous finding is severe pain at 10° flexion in patients who have no difficulty with other simple movements, such as removing their socks.

<sup>6</sup> Regional sensory change Any widespread numbness that involves an entire extremity or side of the body and does not follow expected neurologic patterns is suspect. Innervations are relatively specific, and few spinal conditions other than paralysis simultaneously involve more than one or two roots or dermatomal distributions. A global or "stocking" (ie, the area covered by a sock) distribution of numbness involves the entire extremity and rarely has a traumatic cause. A knowledge of basic neuroanatomy of the extremities is helpful for interpreting numbness patterns.

Reproducibility is another important feature of this sign. Results of sensory testing on the right and the left are compared, then areas in which pain is reported are retested medially and laterally. In patients with neurologic injury, the sensory findings remain consistent. Most non-injured patients do not understand whether an injured area should be more or less sensitive, which explains why their results on comparison testing are often inconsistent.

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| Sign                           | Positive finding   | Status | Notes |
|--------------------------------|--|--------|-------|
| Regional weakness <sup>7</sup> | Sudden, uneven weakness (e.g., "cogwheeling," "dithering") in patient with normal strength on muscle testing | 1      |       |
| Overreaction <sup>8</sup>      | Exaggerated, non-reproducible response to stimulus   | 1      |       |
| Total                          | The predictive value is greatly improved when three or more positive signs are present.                      | 8      |       |

If the sign is present, it is assigned a status of 1. If it is not present, it is assigned a status of 0.

P. Douglas Kiester, MD, and Alexandra D. Duke, DO, in Postgraduate Medicine, Vol 106, No 7, in December 1999 published *Is it malingering, or is it 'real'? Eight signs that point to nonorganic back pain.*  
[http://www.postgradmed.com/issues/1999/12\\_99/kiester.htm](http://www.postgradmed.com/issues/1999/12_99/kiester.htm)

In that article they reflected on Waddell signs and reported that in 1980, Waddell and colleagues (Waddell G, McCulloch JA, Kummel E, et al. Nonorganic physical signs in low-back pain. Spine 1980;5(2):117-25) reported the results of their prospective study of 26 clinical signs in 350 patient evaluations. They identified eight signs (referred to as behavioral signs) that are consistently reliable and reproducible for identifying nonstructural problems in patients with back pain. They adapted the above chart based upon published articles by Waddell and Main and Waddell, (Main CJ, Waddell G. Behavioral responses to examination: a reappraisal of the interpretation of "nonorganic signs." Spine 1998; 23(21):2367-71.

Drs. Kiester and Duke noted that some patients with physical back problems may have one or two Waddell signs. Anxiety, fear, and the desire to please the physician can cause patients to exhibit one or more of these signs.

<sup>7</sup> Regional weakness. Regional muscle weakness also follows established neurologic patterns, and muscle testing can help detect inconsistent signs. Motor strength is graded on a five-point scale, with 5 for normal, 4 for barely resists gravity, and 1 for a flicker of movement. If any muscle group tests 5/5 at any time during the examination, that muscle group is considered normal. In patients with normal strength, the sudden letting go of a muscle may be described as "cogwheeling," "giving way," "breakaway" weakness, or "dithering." In patients with physical weakness, however, the muscle is smoothly overpowered with no jerking, and the response throughout a resisted range-of-motion maneuver remains smooth and constant. This smooth weakness is nearly impossible for a patient with non-organic weakness to duplicate.

<sup>8</sup> Overreaction. The patient may be hypersensitive to light touch at one point during examination but later give no response to touching of the same area. This is a positive sign of overreaction, as evidenced by a disproportionate grimace, tremor, exaggerated verbalizations, sweating, or collapse. Other behavioral signs include inappropriate sighing, guarding, bracing, and rubbing; insistence on standing or changing position; and questionable use of walking aids or equipment.



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Therefore, the predictive value of the Waddell signs is greatly improved if three or more positive signs are present.

#### **Delayed responses**

Dawn Rutherford repeatedly showed delayed responses to examination instructions, taking a much longer period of time to exhibit measurable objective findings and frequently interrupting the examination to talk about the level of her disability. She preferred to talk about her disability rather than stay on task and show the level of her disability. The responses were also varied and, for that reason, required repetition and a very prolonged examination.

#### **Jamar grip strength**

Jamar strength as exerted by Dawn Rutherford is not consistent with the use of her hand to hold a cane while walking or holding part of her body weight for weight bearing stability. This shows that Dawn Rutherford's balance and grip strength are better than she exhibited.

#### **Diagnoses**

Degenerative disc disease in the neck and lumbar spine

History of fibromyalgia, chronic fatigue syndrome, exposure to Epstein Barr Virus

#### **Discussion**

I have answered the questions posed by Sharon Walkaus of MLS National Evaluation Services.

1. Does the claimant have functional impairment(s)? If so, please list the nature and extent of each functional impairment, and the evidence supporting your opinion.

##### **a) Gait**

Gait is assisted with a cane or hand-held assistive device. Nonetheless, weight bearing is symmetrical on both legs, although stride length is reduced. Heel strike is normal bilaterally, and foot flat is intact bilaterally. Abnormal Trendelenburg signs are absent, although toe push-off is reduced. The reduced toe push-off is more likely due to pain than to neurological deficits. Neurological deficits or musculoskeletal deficits that suggest a basis for the use of a cane are absent in light of the preservation of gait characteristics and in light of Dawn Rutherford's retained neurological findings.

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Although the basis for pain cannot be determined from the gait, the need for a slow gait is not dependent upon abnormal neurological deficits or arthropathy. In fact, the need for holding onto her husband and walking with a cane at the same time cannot be discerned from any objective findings outside of tenderness to palpation found throughout the body. The frequent loud outbursts and at times swearing are consistent with the abnormally high Waddell score.

#### b) Lifting

A September 18, 2001 MRI of the lumbosacral spine revealed mild facet joint degenerative changes bilaterally from L3 through S1 and no evidence of significant disc bulging or herniation. Such findings are mild and might be associated with increased pain with prolonged weight bearing either when sitting or standing or with very heavy lifting. A September 25, 2001 MRI of the cervical spine revealed mild degenerative narrowing with marginal osteoporosis at C6-C7, mild degenerative narrowing of disc C5-C6, but absent significant neural foraminal encroachment or other bony lesions. A reversal of the cervical lordotic curve related to spasm or positioning and is consistent with a subjective experience of pain. I find that such imaging findings to be consistent with subjective pain complaints to be expected with very heavy lifting or prolonged neck posturing.

Dawn Rutherford's neuro-diagnostic evaluation was reported as showing no evidence of a lumbar sacral radiculopathy. Dawn Rutherford's examination with me shows normal intact deep tendon reflexes, normal muscle symmetry without atrophy, normal tone without rigidity or spasticity, normal plantar reflexes. As to her variable loss of sensation that does not correspond with any specific dermatomal or myelopathic pattern, and in regard to the variable response given on sensory examination, and the absence of a wide based gait that would correspond with reduced sensation in the feet, I discount its value to determining disability. In regard to any objective determination of neurological deficit, outside of questionable sensory results, I find that none are detectable.

As the examination of the back and legs shows ranges of motion that differ between sitting and supine, as no clear neurological deficit of a radiculopathy or myelopathy can be detected, and as magnetic resonance imaging findings are minimal, I find that some degree of lifting is medically permissible based upon Dawn Rutherford's objective findings.

#### c) Reaching

Reaching is limited to shoulder height. I base this limitation on examination findings that show painful limitation of range of motion in the shoulder and neck. I have no imaging studies of the shoulders to corroborate these findings.

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#### d) Handling

Handling is not limited. Dawn Rutherford, although complaining of pain and showing a significantly reduced grip strength on Jamar testing also shows an ability to hold a cane and her husband's arm when walking. The grip required for these functional activities does not corroborate the abnormally low values exerted by Dawn Rutherford on Jamar testing. Sensory examination in the hands is normal, although for about the first twenty minutes, when the examination was first conducted, Dawn Rutherford expressed an abnormal level of two point discrimination span in millimeters measured.

2. Is the claimant's self-reported functionality consistent with the findings of today's examination and your observations? Please provide detailed information supporting your opinion.

The self-reported functionality is supported by the limited range of motion found on the formal part of her examination. Nonetheless, that limited range of motion noted on the formal aspect of the examination was not supported by any significant findings of soft tissue contractures such as would be expected were the joints never to fully experienced full range of motion. The limited range of motion is also not corroborated by any findings of arthropathy, joint swelling or synovitis. Neurological deficits that could be objectively measured were lacking. Although Dawn Rutherford claimed to be unable to provide any significant resistance on manual muscle testing, her movements reflected a greater ability than that when she was observed during the informal aspect of the examination. She showed an ability to oppose gravity when using her arms for holding onto her husband in order to move the center of her gravity from sitting to standing postures, as well as an ability in her upper extremities to assist with scooting in a sitting position off the examination table.

Although she exerted only three pounds of grip strength on her left and six pounds with her right hand in Jamar testing, she was able to bear part of her weight on a cane when walking in and out of the examination room. Although the weight of the cane is less than 6 pounds, the grip strength needed to keep the cane from slipping out from underneath her upper body weight far exceeds 6 pounds. Either Dawn Rutherford is able to walk absent a hand held assistive device or her husband's assistance or her grip strength is stronger than she allowed on the examination. Both conditions cannot exist together.

Although she stated that she was unable to oppose resistance on manual muscle testing of her legs, she showed adequate anti-gravity strength when walking and maintaining an upright posture. The strength required to support her body weight far exceeds the resistance that Dawn Rutherford expressed a tolerance for on manual muscle testing. The discrepancy between her ability to

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support her body weight when upright and the weakness she showed on manual muscle testing are not consistent and both cannot exist.

Although she stated that she was unable to perceive a monofilament, she was able to walk without a wide based gait or with falling. Although she exerted less than 3/5 strength on resistance to ankle dorsiflexion, her gait showed no evidence of stumbling, foot drop or foot dragging. This discrepancy between manual muscle testing and gait activities is also no physiological and lacks any medical basis.

3. Please identify appropriate restrictions and/or limitations in terms of claimant's ability to perform repetitive and fine motor hand activities, reach, lift, carry, grip, grasp, pinch, sit, stand, and walk, based on the functional impairment(s) you have listed above. Please also note the duration of any applicable restrictions and/or limitations (e.g. temporary or permanent) and the evidence supporting your opinion if not elsewhere documented.

Dawn Rutherford's ability to perform repetitive or finger motor hand activities is allowable for up to one third of the day as her hands show normal range of motion, no contractures, no muscle atrophy and no evidence of neurological deficits. Sensation is intact for normal two-point discrimination although Dawn Rutherford showed a high degree of variability in her testing. Although eventually, after repeated attempts, her sensory testing revealed normal two-point discrimination during the first twenty minutes of the sensory of her hands, she obtained an abnormally reduced ability to perceive two-point discrimination on a 10 gram monofilament. As with many other body parts that were examined for this evaluation, the duration of time required to measure reproducible findings far exceeded the norms.

She frequently interrupted the sensory examination as she did with most of the evaluation to complain of pain. During her second evaluation, when she was informed that only a half hour remained and that the examination could not be finished at the rate at which she was allowing it, she began to respond more quickly. There was a sudden increase in the rate at which she could respond to examination commands and questions, her perception of two-point discrimination doubled and her verbal interferences with examination significantly decreased. Despite her belated attempt to cooperate more fully with the exam, I still found it necessary to schedule a third visit.



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4. Is the claimant's self-reported level of pain supported by and/or consistent your physical examination and test findings, your observations, and documentation reviewed? Please provide a detailed explanation supporting your opinion.

I know of no method to assess the level of self reported pain in regard to whether it is supported by the examination findings. Dawn Rutherford claims pain everywhere and exhibited significant pain behavior of closing her eyes when talking, at times talking loudly, using profanity on occasion to express the severity of pain, frequently interrupted the examination to complain of pain, behaving as though she had never participated in a standard medical examination to assess range of motion, requested her husband to assist with all activities, registered the highest level Waddell score, requested frequent repetitions of examination instructions for simple maneuvers all corroborate symptom magnification.

5. Is there evidence of significant adverse side effects (including cognitive deficit) from any medication or combination of medication(s) that are impairing? If so, please specify which medication(s), the adverse effect, and the evidence supporting your opinion.

Although significant adverse effects of her medications might include cognitive impairment, Dawn Rutherford's cognitive levels did not significantly change between the first examination when she stated she did not ingest medication prior to the examination, the second examination when she stated that she had and the third when she stated that she took medication but felt as though she had not.

6. If today's physical examination, test findings, the claimant's presentation, and documentation reviewed supports significant impairment, please comment on expected treatment, duration and prognosis (Is improvement likely?).

Outside of her diagnosis of degenerative joint disease, Dawn Rutherford's conditions are more psychiatric than orthopedic, neurological or musculoskeletal. In regard to the diagnosis of degenerative disc disease, the mildly abnormal cervical and lumbar magnetic resonance images, tenderness to palpation along the spine, and painful range of motion all support this. The severity of disability claimed from this condition, however, is not supported.



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7. Is there indication of symptom magnification and/or somatic complaints, or underlying psychological factors? If so, please provide evidence supporting your opinion, including results of today's validity testing and your observations.

Symptom magnification of somatic complaints is present. Evidence for such is Dawn Rutherford's interruption of the examination, with verbal pain complaints, raising her voice, using profanity, asking for repeated instructions on a simple range of motion examination that is standard to any medical examination. She shows significant variance between the range of motion she allowed on the formal aspect of the examination performed on an examination table and the range of motion she exhibited when sitting on a table. She also shows delayed responses to all examination requests and a near maximal Waddell score. Her Jamar testing is not consistent with her ability to hold onto her husband and a cane to assist with ambulation, the absent evidence of any joint arthropathy in the hands, joint contractures or loss of muscle bulk.

8. Does the claimant require further testing? Please provide detailed information supporting your opinion.

The Center for Disease Control, ([http://www.cdc.gov/cfs/pdf/Diagnosing\\_CFS.pdf](http://www.cdc.gov/cfs/pdf/Diagnosing_CFS.pdf)) regarding chronic fatigue syndrome, notes the following:

*To be diagnosed with CFS, patients must experience significant reduction in their previous ability to perform one or more aspects of daily life (work, household, recreation or school). And by definition, all people suffering from CFS experience severe, all-encompassing mental and physical fatigue that is not relieved by rest and that has lasted longer than six months. The fatigue is accompanied by characteristic symptoms that may be more bothersome to patients than the fatigue itself.*

*Clinicians should consider a diagnosis of CFS if these two criteria are met:*

*1. Unexplained, persistent fatigue that is not due to ongoing exertion, is not substantially relieved by rest, is of new onset (not lifelong) and results in a significant reduction in previous levels of activity.*

*2. Four or more of the following symptoms are present for six months or more:*

*Impaired memory or concentration*

*Post-exertional malaise*

*Extreme, prolonged exhaustion and exacerbation of symptoms following physical or mental exertion*

*Unrefreshing sleep*

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*Muscle pain*

*Multi-joint pain without swelling or redness adults*

*Headaches of a new type or severity*

*Sore throat that's frequent or recurring*

*Tender cervical or axillary lymph nodes*

As such, Dawn Rutherford meets the Center for Disease Control criteria for chronic fatigue syndrome.

When the chronic fatigue syndrome criteria are met, the Center for Disease Control recommends that health professionals should exclude other illnesses before a diagnosis can be confirmed. Because there is no diagnostic lab test for chronic fatigue syndrome, it is a diagnosis of exclusion. Clinical evaluation of patients with a fatiguing illness recommends Urinalysis, Total protein, Glucose, C-reactive protein, Phosphorus, Electrolytes, Complete Blood Count (CBC) with leukocyte differential, Alkaline phosphatase, Creatinine, Blood urea nitrogen (BUN), Albumin, ANA and rheumatoid factor, Globulin, Calcium, Alanine aminotransferase (ALT) or aspartate transaminase serum level (AST), Thyroid function tests (TSH and Free T4).

If these tests were not performed, then I recommend such.

9. Has appropriate treatment been given? If not, please explain and advise what type of treatment, including frequency and duration would be indicated.

Treatment for chronic pain with minimal objective findings has been reasonable. Such treatment often involves prescribed antidepressant medication, anti-seizure, and analgesic medications and an independent exercise program. Psychiatric treatment is also indicated.

The Center for Disease Control ([http://www.cdc.gov/cfs/pdf/Diagnosing\\_CFS.pdf](http://www.cdc.gov/cfs/pdf/Diagnosing_CFS.pdf)) allows that

*Comorbid conditions that clinicians should be alert for include irritable bowel syndrome, multiple chemical sensitivity, Gulf War syndrome, temporomandibular joint disorder and interstitial cystitis. Fibromyalgia appears to be the most common overlapping condition with CFS. Research suggests that between 35-70% of CFS patients also have fibromyalgia, so it is helpful for clinicians treating CFS patients to be familiar with diagnostic and treatment practices for both illnesses.*

Regarding Dawn Rutherford, I agree that treatment for the chronic fatigue syndrome would include treatment for fibromyalgia. Dr. Dadabhoy and Dr. DJ Clauw, Professor of Medicine, the Director of the Chronic Pain and Fatigue

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Research Center and the Center for the Advancement of Clinical Research, and the Assistant Dean for Clinical and Translational Research, published Therapy Insight: fibromyalgia-a different type of pain needing a different type of treatment in Nature Clinical Practice Rheumatology. 2006 Jul;2 (7):364-372, PMID: 16932722

*...Insights from research suggest that fibromyalgia and related syndromes require a multimodal management program that is different from the standard used to treat peripheral pain (i.e. acute or inflammatory pain). Instead of the nonsteroidal anti-inflammatory drugs and opioids commonly used in the treatment of peripheral pain, the recommended drugs for central pain conditions are neuroactive compounds that down regulate sensory processing. The most efficacious compounds that are currently available include the tricyclic drugs and mixed reuptake inhibitors that simultaneously increase serotonin and norepinephrine concentrations in the central nervous system. Other compounds that increase levels of single monoamines (serotonin, norepinephrine or dopamine), and anticonvulsants also show efficacy in this condition. In addition to these pharmacologic therapies, which are useful in improving symptoms, non-pharmacologic therapies such as exercise and cognitive behavioral therapy are useful treatments for restoring function to an individual with fibromyalgia.*

As such, medications that simultaneously increase serotonin and norepinephrine concentrations in the central nervous system such as tricyclic drugs and mixed reuptake inhibitors are reasonable. Dawn Rutherford has been prescribed tricyclic and anti-seizure medications. Her current anti-seizure medication is Gabapentin. Antidepressant medication that blocks serotonin and norepinephrine reuptake is also reasonable, although I find no mention of such, Cymbalta or Duloxetine for example, in her treatment regimen.

10.If you opine that the claimant is not functionally impaired, please provide a detailed explanation supporting your opinion.

I have discussed this issue in my responses to previous questions.

#### Time

|   |             |
|---|-------------|
| Reviewing Records                               | 225 minutes |
| Face to face contact Wednesday, July 12, 2006   | 120 minutes |
| Face to face contact Wednesday, August 2, 2006  | 120 minutes |
| Face to face contact Wednesday, August 23, 2006 | 90 minutes  |
| Preparing Report                                | 230 minutes |
| Total Time                                      | 785 minutes |

*A. Kimelman MD*

Alan Kimelman MD  
 Qualified Medical Evaluator  
 Diplomat, American Board of Physical Medicine & Rehabilitation  
 Diplomat, American Board of Electrodiagnostic Medicine (EMG)

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FMU: L a . mlu

## **MLS National Medical Evaluation Services, Inc.**

An MLS Group Company

Date of Report: September 13, 2006

### **Independent Medical Evaluation Supplemental**

Patient  
Date of Injury

Dawn Rutherford  
August 15, 2001

Dawn Rutherford presented for an Independent Medical Evaluation in my San Rafael office on July 12, August 2, & August 23, 2006. I have since received your fax of September 13, 2006 and will clarify my report submitted on September 12, 2006.

### **Sources of Information**

Kimelman MD, IME, July 12, August 2, & August 23, 2006

### **Physical Capacities**

In accordance with AMA guidelines, background records, and objective findings of disability were considered in evaluating Ms. Rutherford's capability. In spite of the diagnosable impairments, Ms. Rutherford is perceived to be capable of or limited to the following. These limitations/restrictions are permanent.

*Unrestricted = activity is allowable at a normal frequency*

*Frequently = activity is allowable for up to 2/3 of the day*

*Occasionally = activity is allowable for up to 1/3 of the day*

*Rarely = activity is allowable for up to twice daily*

*Never = activity is not allowed for vocational purposes*

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|               | Unrestricted | Frequently                                       | Occasionally | Rarely | Never |
|---------------|--------------|--|--------------|--------|-------|
| Pulling (lb)  |              |  | 10           |        |       |
| Pushing (lb)  |              |  | 10           |        |       |
| Grasping      |              |  | .            |        |       |
| Pinching      |              |  | .            |        |       |
| Reaching      |              |  | .            |        |       |
| Handling      |              |  | .            |        |       |
| Fingering     |              |  | .            |        |       |
| Gripping      |              |  | .            |        |       |
| Lifting (lb)  |              |  | 10           |        |       |
| Carrying (lb) |              |  | 10           |        |       |
| Walking       |              | Up to 1/2 hour at a time for 4 out of 8 in a day |              |        |       |
| Standing      |              | Up to 1/2 hour at a time for 4 out of 8 in a day |              |        |       |
| Sitting       |              | Up to 1 hour at a time for 6 out of 8 in a day   |              |        |       |



Alan Kimelman MD  
 Qualified Medical Evaluator  
 Diplomate, American Board of Physical Medicine & Rehabilitation  
 Diplomate, American Board of Electrodiagnostic Medicine (EMG)

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